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Managerial Ideas from Labor Pay Metalworking Plant

Needing More Management To Meet the New Competition, a Company Develops It in the Ranks—Shop Committees Raise Quality, Lower Costs

By E. C. Barringer
Associate Editor, Iron Trade Review

MEN, Materials, Machinery—with this time-honored trinity most metalworking companies achieved at least moderate success in the complacent days before the war.

Then, out of the postwar adjustment in industry, emerged the new competition, before which old standards fell. Consumers demanded higher quality at reduced cost. Material prices tended to become stable, leveling off differences between progressive producers. The basis of competition began shifting from price to quality and service.

One metalworking company in Cleveland apprehended the new competition in its incipiency, diagnosed it and at a directors' clinic advanced a remedy. This remedy was a fourth M—Management.

Not management in the sense of a speeding-up of production or a tightening of plant supervision or a closer scrutiny of costs. Rather, a management with its taproot in incisive thinking, designed to conjure up creative ability, initiative and ideas—particularly ideas—which inevitably must flower in quality and service. By a marriage of management with men, materials and machinery, this company proposed to go along with, and not oppose, the new competition.

An experiment was voted. This additional management was not to be purchased in the open market, like so much material, but was to be developed within the company. In the older employes and foremen were vast stores of information and ideas concerning the business, for which the company had paid many times over but never tapped. These men were to be organized into committees, informed of the company's problems, and charged with an impressive share of the management.

The experiment was successful. At practically

The "cabinet" at the Foster Bolt & Nut Co. goes into executive session on shop problems of the day

Thermostatic control of heat treating processes was adopted when a shop committee urged it

no expense the company's management was expanded tenfold. Instead of only two executives concentrating on problems of production and sales, more than twenty minds began mulling over them. The company soon was in position to capitalize its quality and service and thereby ride on the crest of the new competition instead of being swamped in its undertow. It was proved again that a company can lift itself by its bootstraps—and prosper.

* * *

AS MODERN metalworking companies go, the Foster Bolt & Nut Co., Cleveland, is average size. Its main plant at Cleveland embraces 140,000 square feet of floor space, gives employment to 265 persons and has a daily output of 1,000,000 pieces, mostly light and highly finished. The newer but smaller branch at Chicago employs 150 persons and has a daily rating of 400,000 pieces.

Until the advent of the "committee mind" the management was restricted to A. M. Foster, president, and J. F. Donahue, vice president and general manager, plus occasional advice from the board of directors.

For the changing competition which eventuated in the new form of plant management the Foster company cites the automotitve industry. At any rate, the ascendancy of the automotive industry, which absorbs a large proportion of the company's production, coincides with the revolution in marketing. Revolution is what the Foster company terms it.

After the war automotive buyers began stressing quality or, to put it another way, they demanded greater strength with reduced weight at a lower price. Research and initiative at once commanded a premium.

Typical of the advances owing to the new order of things, with the aid of the metallurgists and engineers of the large motor companies, the Foster company developed a high tensile cap screw made of high carbon steel specially heat treated with a tensile strength of 100,000 to 125,000 pounds, compared with the old commercial cap screw of 60,000 pounds tensile strength. This made it possible for automotive companies to use smaller diameters of screws with the proper factor of safety.

It became increasingly apparent to the Foster company that sales were being predicated upon quality of product and the dependability and progressiveness of the producer, rather than upon price alone. Also, by scaling its policy to meet the heightened requirements of the automotitve industry it would be anticipating the needs of other buyers and be in a preferred position to sell them.

"Quality and service being attributes of production rather than of sales, naturally we turned to the men closest to them—the men in the plant," Mr. Donahue explains. "Labor, as a rule, sees only the raw material coming in and the finished product going out. It is unconscious of the strong, continuing efforts of management.

"Took Them Into Our Confidence"

"It seemed logical to select the 'key' men in the plant, acquaint them thoroughly with our problems, relate the difficulties encountered in obtaining business and the service necessary to hold it, give full information concerning our competition and put it squarely up to them to co-operate.

"So we took the foremen and the older employes and formed three committees—quality, service, and cleanliness and sanitation. We took them fully into our confidence, driving home the fact that they really were the salesmen of the company and that the quality and service they rendered our customers insure not only fat pay envelopes but also a steady succession of them.

"Once a week—usually on Tuesday morning—these committees meet separately for a half hour, on the company's time. Conditions that have

How To Operate on a Committee Basis

FOREMEN are the liason between the management and the workers; they are the "key" men on committees.

At the outset assure committee members that even though they be on piecework all meetings during working hours are not at their expense.

Fear of criticizing others seals workers' tongues. Emphasize that all discussion is meant to be constructive.

Always have a topic ready for discussion at meetings. Though the topic be inconsequential, it will provoke discussion and lead to important, basic matters.

Never let petty jealousies between departments crop up.

Workers are prone to present only one side of a case; be certain to get the other before acting.

Unobstructed aisles not only give a sense of spaciousness but make it easier for employes to tend more machines and for tote boxes to be handled

On quality, employes are as insistent as the management, since they realize they are the real salesmen of the company

a constant endeavor to improve. The committee on service considers the scheduling of orders through the plant, packing and shipping. The committees are not autonomous, for their programs must clear through the executives of the plant, and membership on one does not confer any additional authority in the ordinary conduct of a department.

It is important, according to Mr. Donahue, that suggestions for improvements and new policies, if sound, be acted on. Receiving recommendations and pigeonholing them only dulls the edge of the entire program and blankets the spirit of co-operation.

About three years ago the quality committee after due deliberation recommended that the company overhaul its method of heat treating. A case was made by the committee for new equipment which would include thermostatic control of temperature, oil and water and insure a uniform product. The recommendation went to the company's board of directors, was convincing, and an expediture of $75,000 was authorized. It has since proved to be a wise one.

The tendency to substitute piece for day wage rates has been accelerated since the committees took hold. One department seemed ill adapted for piecework, but after considerable study it was attempted. Individual

arisen in the past week are discussed, suggestions made and progress reports on continuing matters submitted. Then, once a month, the three committees meet concurrently, as some foremen are members of all three. We meet at 5 p. m. in the plant restaurant, where dinner is served, and often continue until 10 o'clock. In these meetings the real policies of the company are determined."

Fourteen men comprise each the committee on quality and on cleanliness and sanitation and five the committee on service. Typical of the cross section, the fourteen members of the cleanliness and sanitation include eleven foremen, two workmen and the vice president of the company.

The field of the committee on cleanliness and sanitation is self-evident. The committee on quality discusses technical problems of production, with

What Experience with Shop Committees Has Taught Me

—BY J. F. DONAHUE

EXECUTIVES have their limitations, but management can be multiplied by as many workers as are thinking.

An executive may fool those over him, at least for a while, but never those under him.

The collective opinion of workers concerning the management, be it good or bad, is invariably accurate.

A piece rate for everyworkman and a bonus for every foreman speeds production.

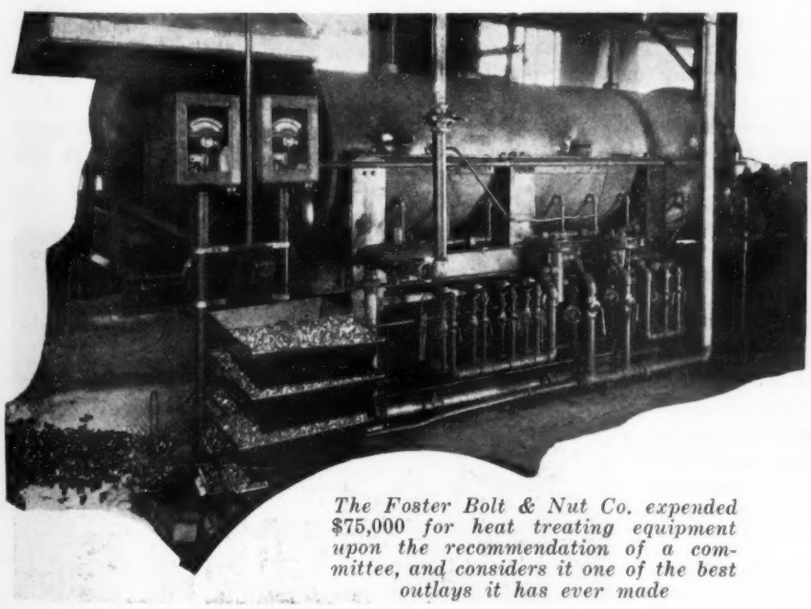
Study carefully before setting a piece rate, but once set maintain it. A factory is a whispering gallery, and nothing spreads so fast or is so destructive to morale as the news that a piece rate has been cut because workers were making too much.

To sift out the drones at the employment gate is impossible. Take labor in the mass, be patient and develop it, and you will have a smaller turnover than if you attempt constantly to replace mediocre workers.

In the long run, material of high quality can be manufactured more cheaply than that of inferior quality because in insisting that workmen do their tasks in a perfect manner you naturally raise the morale and strengthen the character of the individual worker, and as a logical result of having made a better man of him the worker will naturally increase his individual production.

If you create a tradition of quality and splendid workmanship in a company, then automatically the quality of the product increases and the workmen themselves see to it that it does not deteriorate.

Management must set the example. Workers reflect the ideals and ideas of the management. The impression that the management is trying to be fair is invaluable, but must be merited.



The Foster Bolt & Nut Co. expended $75,000 *for heat treating equipment upon the recommendation of a committee, and considers it one of the best outlays it has ever made*

Women employes are responsive to clean floors, adequate lighting and well-painted posts and ceilings

machines were speeded up by installing a larger main motor and better belts and introducing a higher quality of lubricating oil. A piece rate to increase individual earnings was adopted.

In four months production in this department has increased to such an extent that, to equal it on the former basis, $50,000 would have had to be expended for new equipment. This increase has been won at a cost of approximately $3000. True, individual wage envelopes in this department are fatter, but the labor cost per piece has been reduced. No small benefit is that the new basis has eliminated the drones.

Problem Is Discussed

In another department the obstacles to piece work also appeared insurmountable, but the committees attacked the problem and finally presented what seemed to be a workable solution. The eighteen men in the department were called into the vice president's office and the program explained in simple language. It was pointed out that while the gait would be faster the pay would be higher.

Production in this department was immediately stepped up 20 per cent. Three men out of the eighteen proved to be drones and eliminated themselves. The result was a greater outlay for wages but this was offset not only by the increased output but also by the reduction per 1000 pieces in overhead and general plant expense. Such increases in production are important, according to the Foster company, because they obviate capital expenditures for equipment and at the same time lower the overhead per 1000 pieces. Depreciation is broad enough to take care of increased wear on equipment and obsolescence is considered to overtake equipment before its usefulness has been exhausted.

The committee on cleanliness and sanitation has reorganized housekeeping at the Cleveland plant. Disturbed by indiscriminate eating of lunches throughout the plant and the resulting invasion of vermin, the committee urged that a plant restaurant be installed. It was, and has the distinction of being patronized nearly 100 per cent.

On recommendation of the committee, a man was added to the payroll of one department for the sole purpose of keeping the floor more free of oil. Lighting, width of aisles, unobstructed aisles and general cleanliness have been considered. Each week the committee decides which department was cleanest the preceding week, and the winning department receives an appropriate sign.

"The result of bringing the foremen and employes into the confidence of the management and acquainting them with all the conditions relative to sales, service, quality, etc., has been most gratifying and has resulted in a deep interest on the part of the employes in the broad problems of which they formerly knew nothing," declares Mr. Donahue. "It has created harmony and friendliness and has reduced the labor turnover and practically eliminated all labor troubles."

Standard Heads Foundry Equipment Makers

Foundry Equipment Manufacturers association, meeting at the Cleveland Hotel, Cleveland, March 5, unanimously elected Henry W. Standard, president of the Northern Engineering Works, Detroit, president for the ensuing year. Arthur F. Jensen, president Hanna Engineering Works, Chicago, was elected vice president, and H. Cole Estep, vice president, The Penton Publishing Co. was re-elected secretary-treasurer.

Two new directors also were named, M. C. Sammons, secretary, Wadsworth Core Machine & Equipment Co., Akron, O., for 1929, and J. P. Jones, manager of sales, machinery manufacturers section, General Electric Co., Schenectady, N. Y. for 1929-1931.

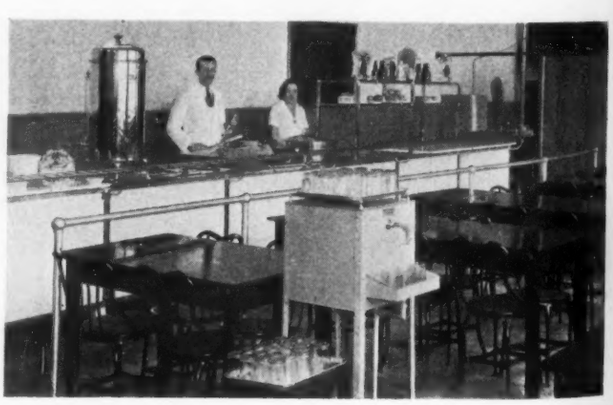
L. P. Robinson, sales manager, Werner G. Smith Co., Cleveland, gave an address, entitled "What is Becoming of the Foundryman's Dollar?" C. J. Stark, president, The Penton Publishing Co., spoke on the business outlook.

Reports of the members on business conditions were exceedingly encouraging. The average of sales for the first two months this year was 90 per cent in excess of the corresponding period in 1928.

Revises Laboratory List

The United States bureau of standards, Washington, is revising its letter circular No. 191, "Testing Laboratories Equipped for Mechanical Tests of Metals and Other Engineering Materials." The bureau, accordingly, is asking all laboratories to submit details of their locations, the names and official titles of persons in responsible charge, a complete list of testing machines, whether commercial tests are made and what kind of work is preferred.

LUNCH boxes are scarce at the Foster Bolt & Nut Co. plant since this cafeteria was installed at the suggestion of a committee



Study Problems of Cast Iron Pipe In Writing New Standards

Sectional Committee Schedules Extensive Program of Research Covering Dimensions, Metallurgy, Processes, Tests, Corrosion and Protective Coatings

AN ELABORATE schedule of work in connection with the preparation of new standards for cast iron pipe and special castings is announced in a progress report just issued by the sectional committee. This body, which is known as the "sectional committee on specifications for cast iron pipe and special castings," was organized in 1926 under the auspices of the American Engineering Standards committee, which now is the American Standards association. The sectional committee was sponsored by the American Gas association, American Society for Testing Materials, American Water Works association, and the New England Water Works association. It consists of 39 men representing producers, consumers and others having general interest in this subject. The committee has organized three technical committees and others have been added to the membership of the latter and their subcommittees so that the total membership exceeds 100.

The three technical committees are No. 1, on dimensions; No. 2, on metallurgy, processes and tests; and No. 3, on corrosion and protective coatings.

Technical committee No. 1 on dimensions has the following subcommittees: 1-a, on barrel of sand cast pipe; 1-b, on bell and spigot dimensions of cast iron pipe including lugs and harnesses; 1-c, to consider all types of pipe other than sand cast; and 1-d, on fittings.

Technical committee No. 2 on metallurgy, processes and tests has been given the task of investigating pig iron and other raw materials entering into cast iron for pipes, melting practice in the casting of pipes, and acceptance tests relating to the strength of the pipes and the quality of metal in them.

This committee has the following subcommittees: 2-a, raw materials and melting practice; 2-b, metallurgy and chemistry; 2-c, physical tests and test specimens; and 2-d, experience.

Technical committee No. 3 has six subcommittees, each of which has been assigned problems in connection with the theory of corrosion, study of coatings and experience regarding water and soil corrosion.

From the standpoint of producers, the work of the subcommittees under technical committee No. 2 on metallurgy, processes and tests are of chief interest. The subcommittee on raw materials and melting practice will consider materials entering into the manufacture of cast iron pipe up to and including the molten state. If this committee should decide that it is not desirable to specify actual composition of the melt, it will so report and give its reasons therefore.

The apparently injurious effects on the quality of cast iron caused by forced output from blast furnaces and from cupolas, the quality of some domestic and imported pig iron now on the market, practical limits in the use of scrap of various kinds, and quality of coke and limestone are some of the questions to be considered by this subcommittee.

The subcommittee on metallurgy and chemistry will make all chemical analyses of metals for the other committees and will consider the desirability of chemical specifications in general for composition of metal in the finished castings.

The subcommittee on physical tests and test specimens has been assigned the task of studying the question of test bars, test specimens and other physical acceptance tests for pipe, and carry on such experimental testing in relation to acceptance tests as may be recommended. An extension of the Talbot tests to other sizes of pipe is one of the suggested lines of study. This committee also will study and collect and analyze test bar data and experience with test bars and other specimens. It will also study the relationship of the strength and deflection of bars to the desirable and undesirable properties of pipe as shown by experience. It also has been asked to study the propriety of substituting the new arbitration bar for the 2-inch and 1-inch bars.

A great deal of the information to be collected by the sectional committee is being obtained by means of a questionnaire which has been sent to over 1000 superintendents of water and gas plants. The returns so far received show that valuable information is being obtained, much of it of a nature never before collected and which will deserve very careful study and require much work on account of its volume. The questions in the questionnaire are grouped under the following headings:

1. General information.
2. Dimensions.
3. Failure of pipe.
4. Barrel of vertically sand cast pipe.
5. Bell and spigot joints for vertically sand cast pipe.
6. Special types of pipes.
7. Fittings.
8. Metallurgy and tests.
9. Internal corrosion.
10. Bituminous coatings.
11. Cement linings and coatings.
12. Soil corrosion.
13. Hydraulics.

The questionnaire is soliciting the

Test Pipe at Three Universities

UNDER the direction of technical committee No. 1, trench load tests which will give new definite information on earth loads are being conducted at Iowa State college. Technical committee No. 2 is directing tests at the University of Illinois on the strength of cast pipe. The methods used by Professor Talbot on 6-inch pipe now are being employed on 20-inch pipe. At the Massachusetts Institute of Technology, tests are being made on the corrosion in water of cast iron pipe of various chemical compositions. Specimens are immersed up to a maximum time of 300 days. These tests are being conducted under the direction of technical committee No. 3.

views of the best men, both superintendents or operators and consulting engineers concerned with cast iron pipe from all three aspects, production, use and general interest, as to such changes in specifications as they would advise, and valuable information of their experience in the use of pipe of various kinds is being obtained.

On all of these tests the pipes come from foundries in different parts of the country and are not specimens picked for the tests but are the ordinary run of pipe, with the view that all tests should give information which will apply to average conditions. Complete information is recorded of all details of manufacture of each piece of pipe so that everything possible will be learned and published to connect cause and effect of all phenomena observed. Published reports will be made of the information available from the tests, from the questionnaire and otherwise, without waiting for the issuance of a final report, so that all information obtained will be available to those interested as completely and as early as possible. Through the generous and enlightened policy of the producers and certain of the users, over $60,000 has been made available for use in the research activities of the sectional committee. Most of this has been contributed by the producers.

Scrap Chapter Formed at Cleveland

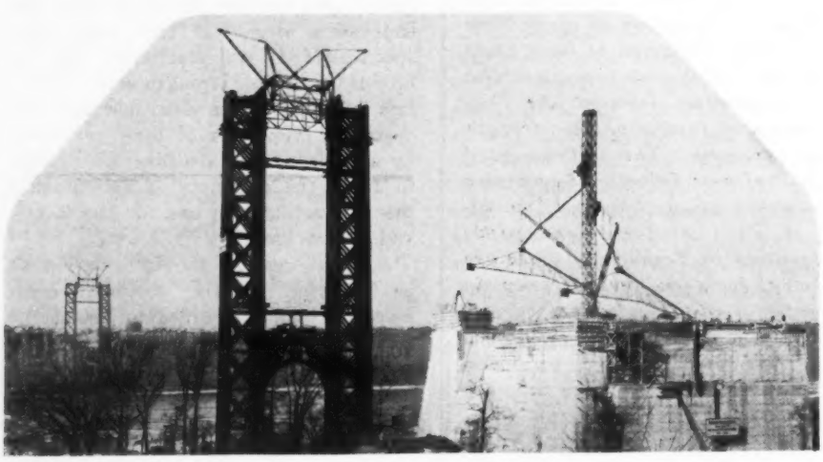
Institute of Scrap Iron and Steel has organized its ninth chapter, to be known as the Cleveland - Detroit chapter. It starts with 40 charter members. Morris Speer of the Rotter Speer Co., Cleveland, was elected president and Jacob Simon of the Simon Iron & Steel Co., Lansing, Mich., chairman of the executive committee. Other officers include E. A. Schwarzenberg, Cleveland, first vice president; Norman Franklin, Jackson Iron & Metal Co., Jackson, Mich, second vice president; Myron Cohen, M. Cohen Sons, Cleveland, treasurer; David Holub, Holub Iron & Steel Co., Akron, is secretary. Other members of the executive committee are George Fisher, United Iron & Metal Co., Canton, O.; C. H. R. Mackenzie, Joseph Schonthal Co., Detroit; Harry Simon, H. Simon Co., Cleveland; Harry Goldman, Riverside Scrap Iron & Metal Co., Detroit; Al Barnett, Barnett Iron & Metal Co., Barberton, O.; I. Bialosky, Cleveland Iron & Metal Co., Cleveland.

Pipe Line Assembled by Electric Welding

A 16-inch pipe line 205 miles long, running from Jal, New Mexico to El Paso, Texas, to carry gas for the El Paso Utilities Co., is being electrically welded. Strung along the cleared right-of-way is the pipe in 30-foot sections, seven lengths of which are lined up at a time for the first welding crew to fix temporarily by tack welding. Another crew follows and completes the welds. The 27 General Electric welding units include self-propelled tack welding machines.

Turning the pipe as the welding progresses is accomplished by one man using long-handled tongs. Every seventh connection is an expansion joint which consists of a short piece of pipe with upset corrugations. After the 200-foot sections are completed they are lined up and the welding done by the bell-hole method in which the position of the welder instead of the pipe is moved. Electrodes of 3/16-inch diameter and a current of approximately 175 to 190 amperes are used. Each operator makes approximately 13 welds in ten hours. After the welded joints are tested and treated with a corrosion resisting compound the pipe is lowered into the ditch.

Steel Towers Erected for World's Largest Suspension Bridge



PROGRESS in the construction of what is to be the world's largest suspension bridge, over the Hudson river, connecting New York and New Jersey, is shown in the above illustration, made from a photograph taken in February. This view is from the New York side, and the tower in the background is across the river, on the Palisades of New Jersey. The four main cables which will be sunk into the anchorage will contain 106,000 miles of steel wire and will weigh 28,500 tons. They will carry a load of 84,000 tons. They are being produced and will be erected at a cost of $12,339,997 by the John A. Roebling's Sons Co., Trenton, N. J. Towers of the span will each be 670 feet above the water level and will contain 40,000 tons of structural steel, to be encased in reinforced concrete. Each will be large enough to surround the Washington monument. The photograph shows the towers approximately 600 feet high. The concrete anchorage on the New York side will be faced with granite block. This man-made cliff will weigh 214,000 tons, and in its construction an ingenious conveying system was devised for handling the concrete materials, by means of a conveying belt manufactured by the Manhattan Rubber Mfg. Co. On the New Jersey side the cables will be anchored in the cliff. The bridge will have an over-all length of 4800 feet, and will cost $75,000,000.

Schedules Power Meeting

The second national meeting of the oil and gas power division of the American Society of Mechanical Engineers will be held June 24 to 27 at Pennsylvania State college, State College, Pa. in conjunction with the third annual oil and power conference of that institution. Various oil engines, parts and accessories will be exhibited. Uniform fuel oil specification standards will be discussed.

Ajax Electrothermic Corp., Trenton, N. J., will shortly have available for loaning to engineers' clubs or societies an 800-foot film, in standard 16 millimeter width, depicting the operation of high frequency furnaces.

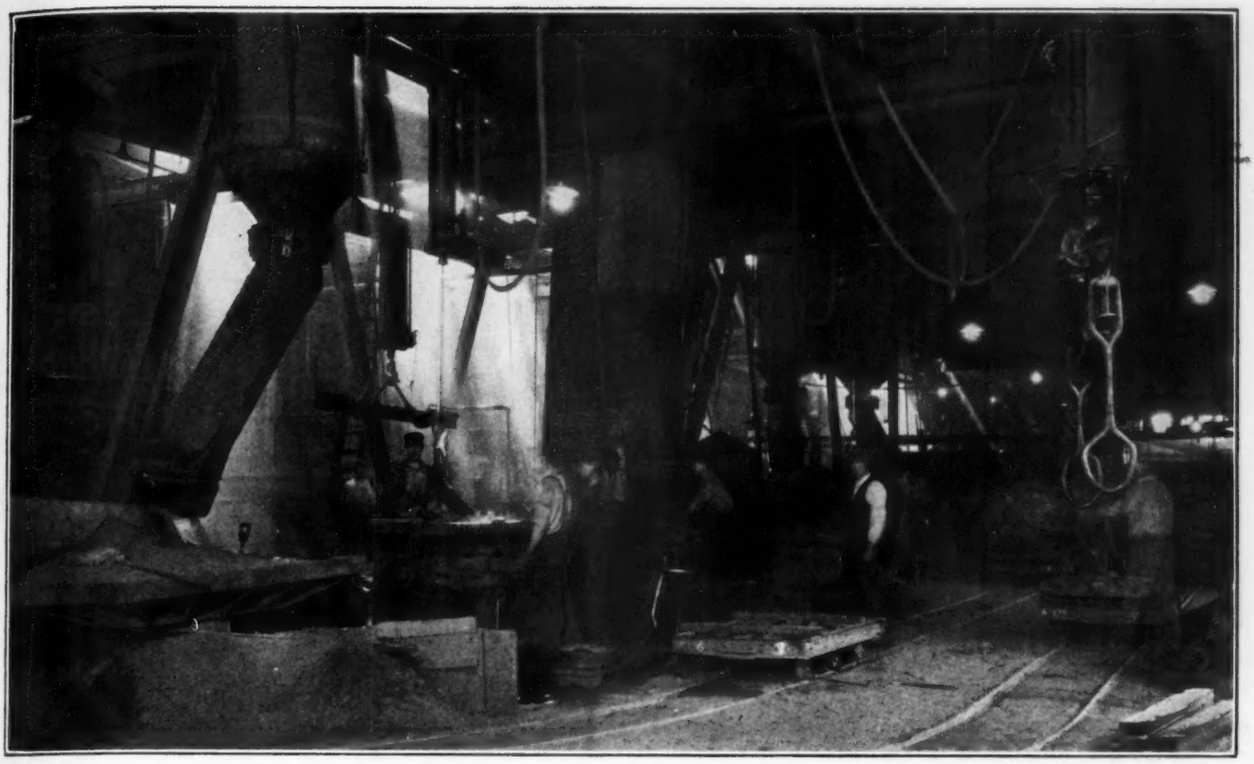


Fig. 1—Narrow-gage car tracks and push cars are used with jolt type molding machines in this continuous molding unit

How Enamel Is Applied to Castings in Pennsylvania Plant

After Thorough Sandblasting and Inspection, Castings Receive Coat of Slush on Which Enamel Powder Is Applied

By J. B. Nealey

AS THE use of enameled ware has increased, the processes incident to its manufacture have been improved and modernized to provide greater production. The enamel ware plant of the Richmond Radiator Co., Uniontown, Pa., is a typical establishment making that type of product. Buildings housing the various departments are constructed of brick and steel and the equipment is of modern design. The molding, cleaning and finishing, enameling, assembling and crating departments are situated in these buildings. Straight line production is used, the product passing through the plant in a straight line until it is finished and ready for shipment.

The storage space for pig iron, coke, and limestone is located on a line with the cupola charging platform. The railroad siding also is at this same level. That arrangement eliminates elevating the charging material to the cupola platform. In the foundry, large ware, such as bath tubs and sinks, is made on jolt type molding machines, which are a part of the continuous molding system.

The molding units have a narrow-gage car track laid in the shape of an oval about 50 feet long. Three stations are located at intervals along the track. The molds are made at the first point in the system. Jolt type machines and a part of one of the continuous molding units is shown in Fig. 1. After the molds are made they are placed on small flat cars and pushed along to the second station where they are poured. Shortly after the pouring operation, the molds are shaken out. The cope and drag flasks are replaced on the cars and returned to the molding unit for further use. The sand from the molds falls into a reciprocating type conveyor, is tempered, elevated and delivered to the different overhead bins to be used over again.

After the castings have been shaken out they are placed on cars which run on a track that connects the shakeout with the cooling floor. After reaching that point, they are allowed to cool. The castings then pass through a series of sandblast rooms where they are cleaned. It is imperitive that all sand be removed from the castings to prevent trouble during enameling operations.

The clean castings are delivered to the grinding room where they are ground, filed and smoothed with a rub stone. After a rigid inspection the castings are sent to the enameling

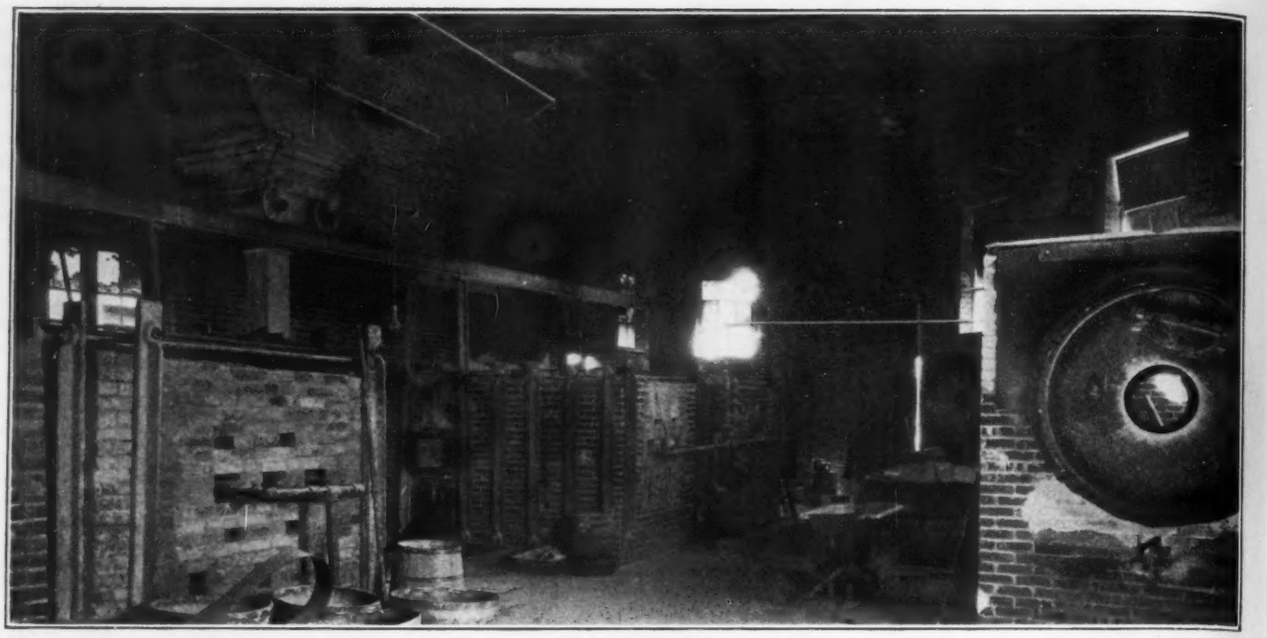


Fig. 2—At the left, is a car in position ready to drop a batch into a hole in the top of the furnace. One of the furnaces used to dry frit is shown at the right

department where they are given a coat of slush as illustrated in Fig. 3. This liquid is poured over the casting. After the coating has dried thoroughly the castings are ready for the enameling operation.

The furnaces used to fuse the enamel upon the castings are of brick construction. They are heated with gas to a temperature of between 1700 and 1750 degrees Fahr. The furnaces are equipped with doors that are raised and lowered by compressed air.

The castings are placed in the furnace and when they have been heated to the required temperature, they are removed from the furnace with a long fork that is well balanced and easily handled by the enameler and his helper. The ware then is placed on an enameling table which is constructed in such a way as to permit the ware to be turned at any angle. This facilitates the application of the enamel powder to the surface of the casting.

The powder is applied with an air vibrator which is attached to a sieve about 10 inches in diameter as shown in Fig. 4. After the application of the powder the casting is returned to the furnace with the fork. It is the usual practice to apply 2 or 3 coats of enamel powder during the enameling operation. This is known as the dry enameling process.

How Enamel Is Made

The making of the enamel or frit is an interesting operation. Enamel is mixed according to a formula that is similar to that used in the production of glass. Practically the same ingredients are required for making enamel as in the manufacture of glass. The ingredients commonly used for making enamel are as follows: Feldspar, soda ash, antimony, tin, zinc oxide, borax, litharge, fluorspar, nitrate of soda and flint. After the different materials are mixed sufficiently, the conglomerate commonly is known as a batch and is ready to be melted.

The melting furnaces are of brick construction. They are fired with gas, and are heated to a temperature of 2250 degrees Fahr. The enamel batch is placed in a car, that is operated on an elevated track directly over the top of the melting furnaces. The batch is discharged from the car into an opening in the top of the furnaces as shown in Fig. 2. After the batch is melted, which requires about 3 hours, it is ready to be withdrawn from the furnace. The batch is in a molten or liquid state and is withdrawn from the furnace through a tap hole and allowed to run into a pit filled with clean water. It is stirred while running into the water to break it into finer particles. At this stage the enamel is commonly spoken of in trade circles as frit.

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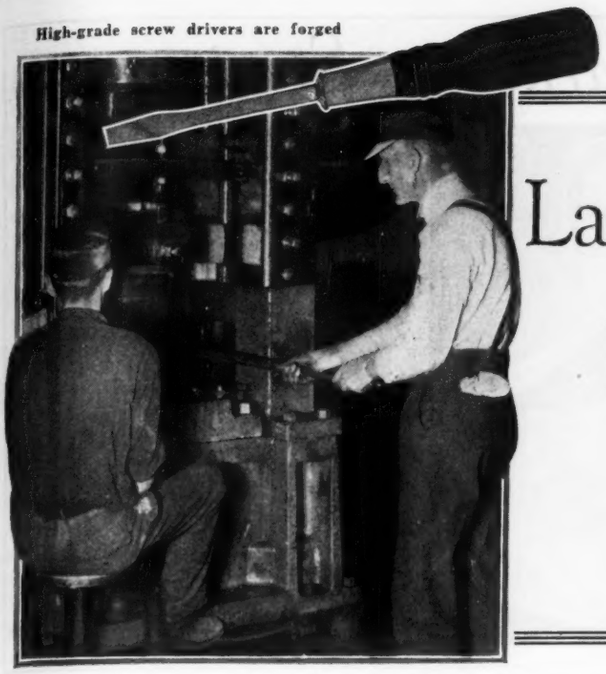
Fig. 3—Before the enameling operation the castings are given a coat of slush. Fig. 4—The powdered enamel is applied with a vibrator operated by compressed air

High-grade screw drivers are forged



Large Uses of Steel In Small Ways

136th Article — Screw Drivers

A MODERATE, but steadily increasing tonnage of steel enters into the production of screw drivers annually. Current consumption is at the rate of approximately 2500 tons a year, or a gain of about 75 per cent since seven years ago, when regular statistics became established for this industry.

This growth is reflected in the following comparative statement, giving shipments in terms of dozen-lots: 822,760 dozen in 1922; 974,320 in 1923; 884,920 in 1924; 1,016,420 in 1925; 1,032,440 in 1926; 1,208,610 in 1927; and 1,352,050 in 1928. Only in one year, 1924, was there a setback, and that was more than made up in the 12 months following.

In estimating the amount of steel used, manufacturers say that close to 80 per cent of the screw drivers sold have blades ranging in length from 2 to 6 inches, and that nearly all of the remaining 20 per cent have blades varying from 7 to 12 inches. Some blades are longer than 12 inches, and some are less than 2 inches, but their aggregate tonnage is relatively light.

The quantity of steel used in a screw driver varies, even when the lengths of the blades are the same. In some of the smaller sizes there is a difference between types of two or more pounds per dozen, and a difference of 4 pounds or more in some of the larger sizes. Where the usual type is compared with semiautomatic screw drivers the difference is considerably more. However, the sale of the heavier and semiautomatic types is restricted.

A type weighing in dozen-lots from 1½ pounds for those with 2-inch blade, to 9 or 10 pounds for those with 12-inch blade is used as a basis for estimating the amount of steel consumed. In such a type the steel extends completely through the handle. This brings up the important question as to what percentage of materials going into the average screw driver is steel. Authoritative estimates are that all but 10 per cent of the weight is steel.

Industry Is Century Old

Screw driver bits are an item, yet it is doubtful if they take more than 1 per cent, and certainly not more than 2, of the steel going into these tools.

Screw drivers were first produced in this country on a commercial basis more than 100 years ago. Contributing materially to the early development were two men, Hurley and Wood, who established a little plant which formed the nucleus of what is now the Southington, Conn., branch of a well-known manufacturing company.

The type developed by these men called for the heading of the blade or shank and the driving of the blade through the handle, whereupon it was drawn out under a hammer, then toughened and polished. This process is used today, with modern equipment, steel now being used instead of iron. Ferrules were pinned on in many instances, although in the less expensive drivers the ferrules were secured to the handle by means of flutes. These two methods also are in use today.

Later a heavy forged screw driver with two wooden scales riveted on either side was developed and produced exclusively by a Southington manufacturer until about 1920, when patents expired. This type has been added to the lines of leading manufacturers.

Blade steel for screw drivers usually arrives at manufacturers' plants in 20-foot lengths, whereupon it is cut into 5-foot lengths for handling.

THIS is the one hundred thirty-sixth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

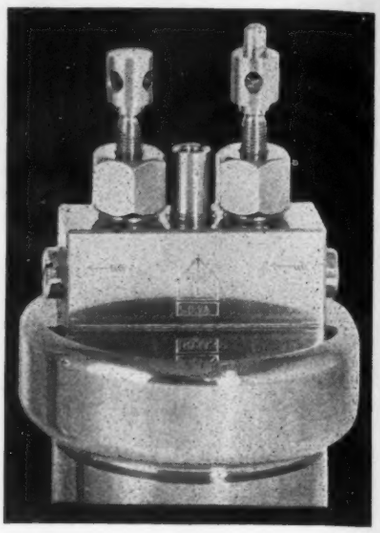
Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Swords	*Bathroom Fixtures*
Paving Guards	*Snow Fences*
Reaction Kettles	*Stairs*
Fire Screens	*Cork Screws*
Voting Machines	*Universal Shafts*
Display Racks	*Sewing Machines*
Steel Stamps	*Lanterns*
Wire Screens	*Cleats*
Typewriter Spools	*Axes*
Chain Hoists	*Steel Ceilings*
Newspaper-Vending Boxes	*Card Tables*
	Welding Rods
Wire Lamp Shades	*Washing Machines*
Belt Fasteners	*Resilient Road Guards*
Sap Spouts	

To Exhibit Oil Engines

The second national conference on oil and gas power will be held at State College, Pa., June 24 to 27 under the auspices of the American Society of Mechanical Engineers. A feature of the conference will be an exhibition of oil engines, parts and accessories. Every representative manufacturer of diesel engines is expected to attend. Last year, in the first exhibit, over 20 companies participated.

Lustrous Sparkling Steel



New Chromium-Nickel Steel Gleams Like Polished Silver

Finds Wide Application in Many Beautiful and Practical Articles—American Manufacturers Expanding Facilities To Utilize Krupp Development

By E. C. Kreutzberg

Associate Editor, Iron Trade Review

ON THE desk of H. G. Batcheller, first vice president, Ludlum Steel Co., Watervliet, N. Y., are a number of steel articles. Among them are an ink well and an accompanying stand, a pocket knife and a mirror for a compact. All have highly lustrous surfaces which reflect images like glass mirrors. These objects were made from steel containing 18 per cent chromium and 8 per cent nickel, developed some years ago by Krupp interests and now used extensively in Germany for the manufacture of such articles as those named, also dental and surgical tools, fountain pens, tableware and cutlery.

Production of this chrome nickel steel in the United States is provided for under an agreement between the Krupp interests and a number of American companies. To handle the working details under this agreement, the Krupp Nirosta Co. Inc., recently was organized under the laws of New York state with Mr. Batcheller as president. The American companies who are participants in this agreement, and who will manufacture the chrome nickel steel under the Krupp patents, are the Ludlum company., the Central Alloy Steel Corp. and the Firth-Sterling Steel Co. These companies also will roll the steel into certain finished forms. Sublicenses also are being granted to other companies, enabling them to obtain the steel in semifinished state from the primary licensees, to be rolled into other finished forms. The present plans call for making this steel available in the complete range of sections and sizes in which plain carbon steel now is produced.

The Ludlum company has started the production of chrome nickel steel in its electric furnaces at Watervliet, N. Y. The company now is carrying out an extensive expansion program whereby it will forge, roll and draw this material, the products to be forgings, bars and wire. Facilities are being installed at Watervliet and at Dunkirk, N. Y., the latter point being the location of the plant of the Atlas Steel Corp., which recently was acquired by the Ludlum company. The latter company is importing a large amount of equipment from Germany, designed for treating and working the chrome nickel steel.

The Central Alloy Steel Corp., after working out details of practice, now is in the final stages of an expansion program for producing a full line of sheets from this material.

Polished sheets of the new analysis have a surface brighter than the finish formerly obtainable with the usual iron-chromium alloys. A high finish also can be obtained by certain methods of cold rolling, eliminating the polishing operation. For many applications, a bright pickle is sufficient, the resulting silver *matte* surface being very attractive. A satisfactory polished finish has been one of the difficult problems confronting producers of stainless sheets. The Central Alloy corporation reports this difficulty is largely overcome with the

advent of new chrome nickel material.

Present sublicenses included the Lukens Steel Co., which will obtain the steel in the form of slabs and roll it into plates; the Babcock & Wilcox Tube Co., which will manufacture boiler tubes from chrome nickel skelp, and the Spang, Chalfant & Co., which will manufacture chrome nickel steel pipe.

The Krupp patents on chrome nickel steel cover the entire series of alloys resulting from varying combinations of chromium and nickel. The steel will be known as Nirosta steel, a German equivalent of nonrusting. The analysis which is of present importance in this series is that containing 18 per cent chrome and 8 per cent nickel, but the new patented methods of heat treatment are regarded as the prime factors of advance. It is listed as Nirosta KA2, which is equivalent to "nonrusting Krupp austenitic No. 2."

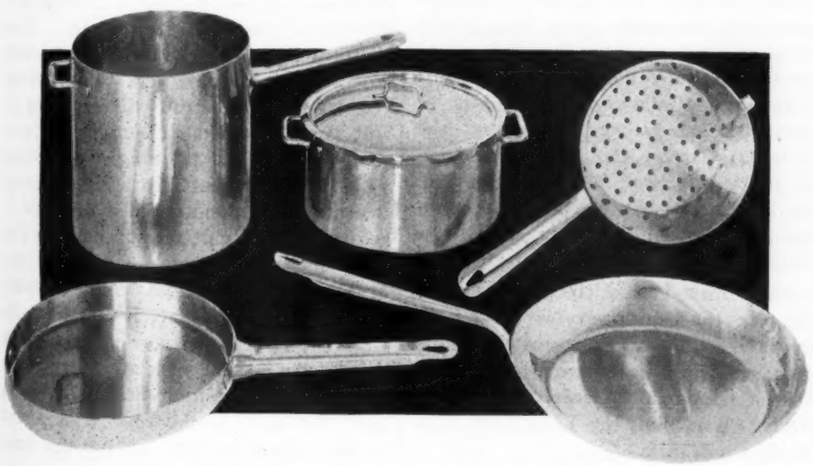
The Central Alloy corporation and the Ludlum company report that with the new steel and the recently acquired Krupp processing methods they are able to sweep away virtually every existing difficulty in meeting various requirements in corrosion and heat-resistant steel. The addition of nickel is one factor which has eliminated difficulties the makers formerly encountered with plain chrome steel. The second factor, and one which is equally important, is the heat treatment essential in connection with chrome nickel steel and which has been worked out by the Krupp interests. Dr. Benno Strauss, of the Krupp firm, has been to the United States twice recently to instruct the American licensees.

Possibilities of the chrome nickel series are described as follows by Mr. Batcheller:

"This material can be hot rolled into sheets, pickled, given two cold passes and buffed, whereupon we have a highly lustrous finish. It is free from the countless fine scratches which we used to get on plain chromium steel. The lustrous surface of the cold rolled chrome nickel steel can be further polished, thus producing a mirror finish superior to anything obtainable with glass.

"Because of its remarkable ability to take a polish the new material has a wide field of usefulness where the surface is a vital factor. By the heat treatment, the physical characteristics of the new alloy can be fully controlled. The material can be forged, welded, stamped, spun, drawn into tubes and wire and it is highly adaptable to deep drawing. The resistance of the new alloy to corrosion exceeds that of plain chromium steel and the resistance becomes particularly pronounced in contact with mixtures of acids. We have found by exhaustive tests that the new material can safely be recommended for use in oil still tubes, which because of a combination of high pressures, high temperatures and mixtures of acids is a severe test.

Tableware has a mirror-like finish, and is stainless



Kitchen utensils that are being made of the new alloy steel

"While we do not recommend the use of chrome nickel steel in excess of 1800 degrees Fahr., the analysis can be varied to make this steel corrosion resistant up to 2300 degrees. This new steel is hardened by cold working, after which it may be softened by heat treatment.

"In view of what has been accomplished in Germany, we look for many changes as a result of the adoption of chrome nickel steel in the United States. In Germany, for instance, oil still tubes are made entirely of chrome nickel steel. Pen points for fountain pens are made entirely of this material. High-grade cutlery, kitchen and tableware are made from it. An interesting use which indicates the range of possibilities is in connection with tubes. The Germans make chrome nickel steel tubes in a variety which ranges from seamless drawn tubes for hypodermic needles, a few thousandths of an inch in diameter, up to 12-inch seamless tubes. Chrome nickel steel wire is drawn down to one thousandth of an inch in diameter.

"A very strange use for this material in Germany, which has been directed to our attention by Dr. Strauss, is in the form of plates for false teeth. The metal is absolutely proof against stains of any kind, has a finish which eliminates any tendency toward friction in the mouth and its surface is so smooth that nothing will adhere to it.

"One of the features of the agreement controlled by the Krupp Nirosta Co. Inc. is that the licensees have complete access to the Krupp laboratories and mill data in Germany. Representatives of the American licensees have been making regular

(*Concluded on Page* 722)

Left to right: William Frew Long, S. D. Wright, William H. Jones, W. L. Seelbach, H. L. Briggs, M. D. Jones, John E. Fintz

Cleveland Foundrymen and Schools Unite for Training Apprentices

INDUSTRIAL vocational training has proved so successful in Cleveland that the work is to be extended with a well-equipped foundry. With this in operation in June, 1929, the Cleveland Trade school will be training students in 11 trades, including machine shop practice, automotive mechanics, sheet metal work, plumbing, electricity, foundry work, carpentry, paper hanging, painting, bricklaying and stone cutting. This work is founded on the principle that unemployment can be minimized, and all interests of a community benefited by giving young men training in useful occupations, as it has been noted that unemployment affects most directly those who are inexperienced.

The completion of the new school will be the result of three years' cooperative effort on the part of representatives of the foundrymen of Cleveland and the board of education. The board observing the progress made in other vocational lines, finally authorized the expenditure of $45,961 for the foundry building, and it is to be equipped by the foundry group.

Ground was broken for the foundry school March 6, adjoining the present vocational training school. Representatives of the board of education and the American Plan association of Cleveland watched William H. Shilling, superintendent, Atlas Foundry Co., and chairman of the association's foundry apprenticeship committee, turn the first shovelful of earth. The school board was represented by M. D. Jones, principal of the trade school; John E. Fintz, co-ordinator, and H. L. Briggs, director, department of vocational education. Those present from the American Plan association were: S. D. Wright, president of the association, and vice president, Atlas Car & Mfg. Co.; William Frew Long, general manager of the association; W. L. Seelbach, treasurer of the association, chairman of the general foundry group, and secretary-treasurer, Forest City-Walworth Run Foundries Co.

Committee Is Appointed

The foundry apprentice committee appointed to work with the school board in conducting the foundry school consists of the following: W. H. Shilling; Tracy Calhoun, the Johnston & Jennings Co.; George Hammink, the Wellman Bronze Co.; F. J. Grondie, the Kilby Mfg. Co.; W. J. Strangward, the Forest City-Walworth Run Foundries Co., and Daniel Gluntz, the Gluntz Brass Foundry Co.

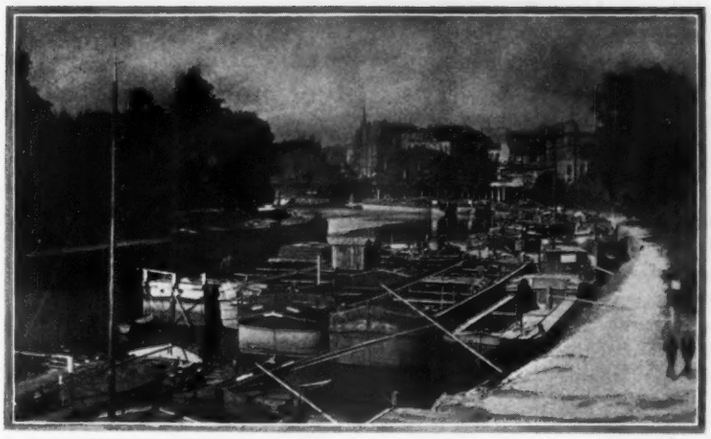
An additional committee, charged with securing the equipment for the school, consists of J. W. Strangward, chairman; F. N. Lansdowne, the West Steel Casings Co.; Daniel Gluntz, and A. H. Chappelka, the Lake City Malleable Co.

Boys 15 to 16 years of age who elect to take foundry training will spend their first year entirely in the school. Not less than 50 per cent of their class time will be devoted to work in the foundry proper in actual productive work, 33 1/3 per cent of their class hours will be spent in studies directly related to the foundry industry, and the remaining 16 2/3 per cent of their class hours may be spent in studying academic subjects.

During the second year the student will alternate between the school and industry, one-half time being spent in the school and one-half as an apprentice in a Cleveland foundry. During the third year the apprentice will be returned to the school for approximately 144 hours of instruction directly related to the trade. This amounts to approximately one-half day in school each week. The fourth year of apprenticeship will be spent in full time work in a foundry. Upon completion of his training the student will receive a certificate of apprenticeship corresponding to a diploma.

Students will not receive pay for the time they are in school during the first and second years. A reasonable rate of pay will be given for the half-time the apprentice spends in a plant during the second year and during the third year the apprentice is to be paid for the half-day per week spent in the school as well as for the time spent working at his trade.

Central European countries use their waterways largely for moving raw materials and finished products.



Fleet of wooden barges on the Saar river at Sarrebruck. The population of this city is largely Prussian.

IRON TRADE REVIEW'S European manager has contributed numerous articles describing the iron, steel and metalworking industries in Great Britain and on the Continent. These are in addition to the weekly news letters from this publication's correspondents in the principal capitals of Europe, the weekly cablegram reporting latest market information, and the quarterly review summarizing business conditions in the European countries, with special reference to iron and steel. The accompanying article deals with the Saar territory, "where the porter's gratuity is paid in French currency, but where he thanks you in German." It is characteristic of the time and place that the article deals first with coal and coke, and how the supply is divided. New process and equipment have been devised by the French to use the coal, abundant but not satisfactory for coke, as mined. The second part of the article, dealing more fully with iron and steel manufacture in the Saar territory, which is autonomous, will be presented in an early issue.

Saar Steel Industry Progresses Under French Control

Rich Coal Fields Developed, Though Territory May Return to Germany —New Methods Devised for Using the Fuel for Making Coke

By Vincent Delport

European Manager, Iron Trade Review

A TRAVELER already familiar with conditions in France and Germany experiences a peculiar feeling after having spent several hours in the industrial district of the Saar. Arriving at Sarrebruck, the capital of the territory, his first impression is that he has landed in Germany. German is the language; yet, having crossed the border from France he has experienced no passport formalities.

One is agreeably surprised not to have been subjected to the usual customs inquisition, that unavoidable toll which characterizes any passage from one European country to another. The porter's gratuity is paid in French currency, but he thanks you in German. Coming out of the station one sees the French flag flying on the mast of the administrative building of the Mines Domaniales de la Sarre, and soon finds the postage stamps are neither French nor German, but Saar stamps, showing various monuments, or a picture of a mine, characteristic of the district.

Soon, however, one realizes that the Saar territory is German, and will remain German. In Sarrebruck especially most of the population is of Prussian origin. This fact is fully recognized by the French authorities.

The exceptional situation of this province, which has an area of 750 square miles and a population of 660,000, results from the terms of the treaty of Versailles. The Saar territory is autonomous, but is governed by a council of five, appointed by the League of Nations. Immediately after the signing of the treaty the first president of the council was French; his successor was a Canadian, and the present head is British. The negotiators of the treaty also have fixed the

Table I

Saar Coal Production

	Output (metric tons)	No. of workmen above and underground	Output per man per shift (kilograms)
1913	13,216,000	53,050	777
1919	8,971,000	59,949	524
1920	9,410,000	70,036	481
1921	9,575,000	70,171	515
1922	11,240,000	70,291	606
1923	9,192,000	71,669	639
1924	14,032,000	71,863	708
1925	12,990,000	69,674	680
1926	13,681,000	70,942	692
1927	13,596,000	66,500*	740
1928*	13,250,000	60,000	805

*Estimated.

Table II

Where Saar Coal Is Shipped

(Metric tons, 000 omitted)

	1927	1926	1925	1913
Saar district	4,360	4,258	3,753	4,034
France	4,363	5,411	4,750	950*
Germany	1,046	778	938	4,278*
Italy	474	517	507	183
Switzerland	386	360	454	737
Belgium and Luxemburg	278	317	339	141
Austria	39	5	178	23

*Pre-war boundaries.

boundaries of the Saar district which is bordered north by the Prussian Rhineland, east by the German Palatinate, south and west by Lorraine, now belonging to France. It is provided that in 1935 inhabitants of the Saar will decide by plebiscite whether the territory shall return to Germany, be joined to France, or remain an autonomous state. While it is taken for granted that the industrial sections will vote for the German nationality, there is some doubt as regards the wishes of the smaller localities, who may claim autonomy, but is unanimously recognized that the Saar will not become French.

The Saar district is rich in coal, the coalfield covering an area about 15 x 30 miles. Exclusive right of exploiting the Saar coal was granted to France for a period of 15 years, as a compensation for the destruction of the coal mines of northern France. At the end of the period Germany can regain the mines by purchase, and their value has been fixed at 300,000,000 gold marks ($71,250,000), to be paid to France on reparations account. It is stated, however, that this figure will be revised. Under the present status the coal mines and the coke oven plants attached to them are operated under control of the French government by an administration known as the Mines Domaniales de la Sarre. The technical and administrative staff is French, the miners are German. Practically all the mines are being operated, although some are not producing to capacity, owing to the unfavorable conditions of the coal trade.

Table III

Iron, Steel and Coke Production in Saar Territory

(Metric tons)

	Coke at the mines	Pig iron	Semifinished steel	Rolled products
1913	250,410	1,370,980	2,079,825	1,652,414
1919	209,329	631,065	713,860	568,549
1920	239,637	643,715	739,710	580,811
1921	177,386	896,096	920,052	.....
1922	253,120	1,156,550	1,262,038	.....
1923	133,002	1,021,391	996,821	.....
1924	216,099	1,389,117	1,446,540	.....
1925	272,352	1,449,700	1,578,760	1,269,019*
1926	255,270	1,624,702	1,736,762	1,400,846*
1927	262,388	1,770,718	1,894,629	1,533,027*
1928	260,000*	1,930,000*	2,070,000*	1,700,000*

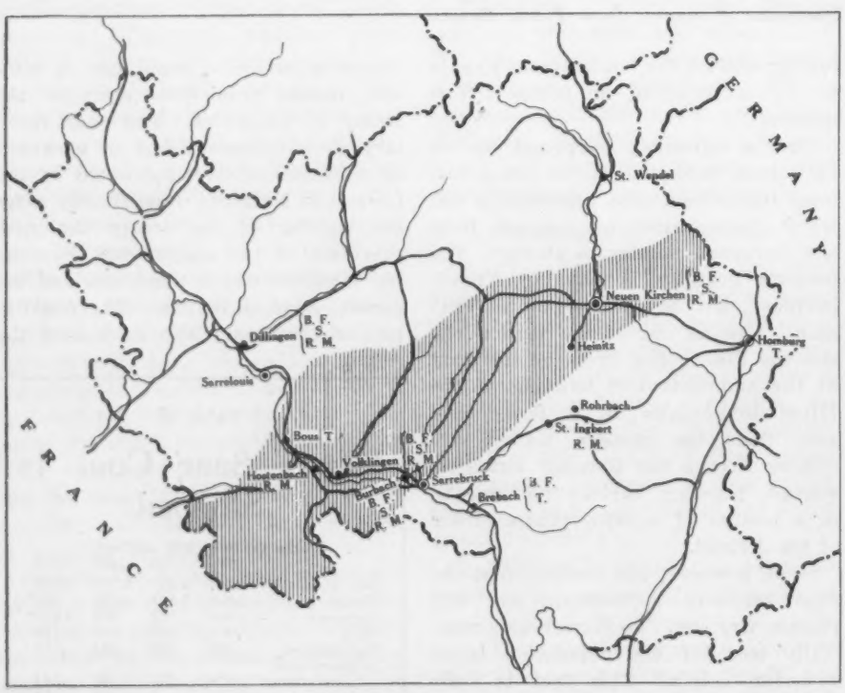
*Estimated.

The annual output of coal in the Saar, under what may be termed normal conditions, is 13,000,000 to 14,000,000 metric tons. Table I shows that the output in 1913 was 13,216,000 tons, while the average annual production in the years 1924-28 was about 13,500,000 tons. The year 1919 was the last of German operation. There was a certain amount of disorganization, and a shorter work day was introduced. This accounts for the decrease to 8,971,000 metric tons. From 1920 the output gradually increased. The year 1923 was exceptional, when production dropped due to the effects of the Ruhr strike, which lasted about 100 days. The collieries of the Frankenholz mine, which were operated under lease before French control, have preserved their status. The output of this mine is included in Table I and averages 400,000 tons a year, slightly less than 3 per cent of the total Saar output.

The most interesting feature in Table I is the increase of output per man per shift. It will be noted that in 1913 the output was 777 kilograms, but then the men were working one hour more a day. In 1919 the output per man was 524 kilograms. It dropped to 481 kilograms during the first year of French operation, but gradually increased until it reached about 805 kilograms in 1928. The number of men employed above ground and underground in 1928 was 16.5 per cent less than in 1924, when the output per man was only 708 kilograms. This is due to the technical improvements and to the measures of rationalization brought in by the French managers, and for that reason it is claimed the Saar coal mines are worth more, as a going concern, than the amount originally fixed by the committee of experts.

The mines are operated by the French authorities on a business basis, and any profit goes to the French treasury. The basic wages paid in the Saar district range from 35 francs to 40 francs ($1.36 to $1.56) a day, according to the job and whether a man supports a family. The French government has undertaken to supply the Saar district with the amount of coal consumed there before the war, about 4,000,000 metric tons. The surplus is marketed. Table II shows the destination of the Saar coal in 1925, 1926 and 1927, compared with 1913. France has taken the place of Germany as the most important customer for Saar coal. In 1927 France took as much as the Saar district itself, or about 32 per cent of the year's output.

Approximately 64 per cent of the output of the Saar mines is a bituminous coal, which when used alone gives inferior coke, 30 per cent is



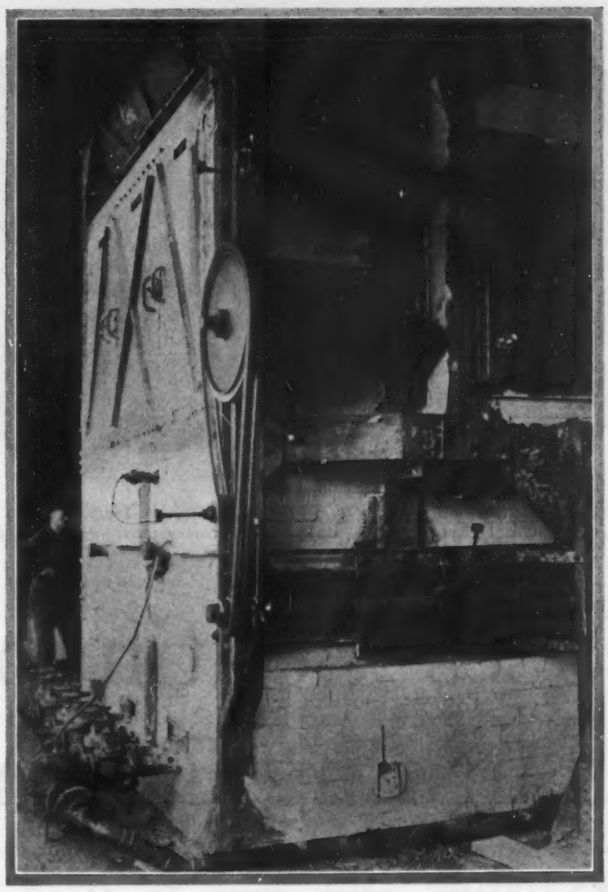
Map of the Saar territory. Shaded portion represents the coal fields. Locations of blast furnaces, steelworks, rolling mills and tube mills are indicated by initials following names of towns

termed *charbon flambant*, or flaming coal, which is unsuitable for coke, and 6 per cent is a lean, dry coal (*magerkohle*) which can be used only for domestic purposes.

Coke manufactured with the Saar bituminous coal forms into lumps which taper to a point and are of a dendritic structure. Such coke is hard, but brittle, and when dropped on the ground it breaks up into small pieces and dust. Consequently, this coke is unsuitable for modern blast furnaces, where it is crushed by the weight of the charge. The old types of blast furnace stacks which still are seen in the district were small and purposely designed to utilize the Saar coke.

When furnaces of large capacity were built it was found necessary to obtain high-grade furnace coke from outside sources. Previous to the period of French control the main source of supply was the Ruhr. During the past nine years, however, the French technical staff has applied itself to the problem of improving the quality of Saar coke by blending certain grades of coal coming from northern France or from the Ruhr with the Saar bituminous coal. The experiments proved satisfactory, but the high cost of transporting the foreign coal was a serious charge and rendered the process uneconomical. It then was thought possible to blend the Saar flaming coal, suitably treated, with the bituminous coal obtained locally, and experiments were conducted at the Heinitz coke oven plant, a few miles from Sarrebruck and under the control of the Mines Domaniales de la Sarre.

The two grades of coal are blended in the proportion of about 13 per cent of flaming coal and 87 per cent of bituminous coal, but the mixing takes place only after the coal has been dried and pulverized, and when the flaming coal has undergone a process of semidistillation. A general view of the plant is shown below.



A Salerni retort oven. Five like this are in operation at the Heinitz coke plant, where low-grade coal is utilized in making satisfactory metallurgical coke

The pulverized coal is first conveyed to the building at the right, in the illustration, where it is cleaned and dried. From there it is taken by belt conveyor to the building at the left, which contains a battery of five retort ovens of the Salerni type, Salerni being the name of the Italian inventor of the process. The bituminous coal is taken on a belt at the back of the building, while the smaller proportion of flaming coal is conveyed in the front. Before being dried and treated, the flaming coal contains from 15 to 20 per cent moisture, about 35 per cent volatile matter and 8 per cent ash. The bituminous coal contains about the same amount of volatile matter as the flaming coal, but there is less oxygen and more carbon.

The retort ovens are heated by means of coke oven gas, and a heat recuperating chamber is provided under each furnace. The temperature of the gas is about 900 degrees Cent. at the admission, and can drop as low as 70 degrees at the outlet. The pulverized flaming coal drops into the furnace through hoppers which regulate the delivery. It is received at the top of the furnace on a table. A series of scrapers pushes the coal toward the farther end of the table, whence it drops on to a succession of similar tables, and finally coming back to the front part of the oven, the coal drops into a train of movable troughs which slowly conduct it to a hopper at the lower part of the back of the oven.

The process of distillation commences on the table, where the coal is thoroughly dried, and when arriving at the end of its course in the troughs the resulting fuel is a semicoke containing no moisture and in which the contents of volatile matter have

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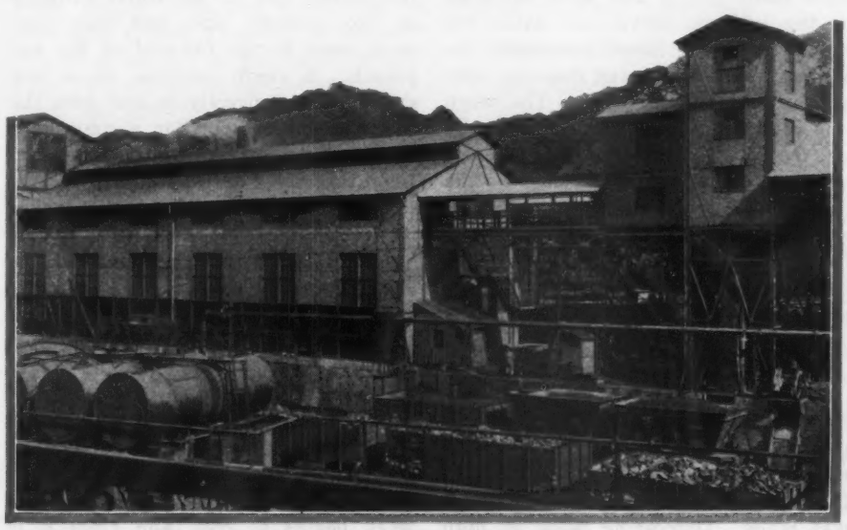


Salerni plant, at Heinitz, where Saar coal is distilled to improve the quality of the coke

Box-type continuous furnace for burning holloware. At right is shown first coat ware emerging from furnace. Ware on ingoing side is heated by outgoing work

Uses Continuous Furnace for Burning Enameled Holloware

Double Conveyor Chain Facilitates Transfer of Heat; Increases Output

By J. S. Markert

Chief Engineer, Ferro Enamel Supply Co., Cleveland

ENAMELING methods rapidly are changing. Improvements have been made in every operation, the most interesting of which is the continuous furnace. Burning capacity in enameling practice always has been the gage of maximum production in any plant. Other operations, although important, cannot go beyond what the furnaces will burn.

The first furnaces used were of many types and kinds. With coal as a fuel, full muffled furnaces generally were accepted as a standard. Soon oil and gas entered the field. These faster fuels resulted in marked improvement in design and furnace materials. About the same time shops began to feel the necessity of increasing furnace production and high-speed refractories, better insulation, double forks, hanging racks, double and triple decking of cast iron, etc., all followed in rapid succession. Furnace production was in most cases doubled and tripled over previous records.

Spraying, drying, brushing, and accessory operations lagged for only a short time. Soon continuous spraying machines of large capacity were in operation. High-speed suction brushing equipment was installed, and automatic conveyors and dryers again placed the furnace on the offensive.

The first attempts made to apply the continuous furnace to the enameling industry were not encouraging and many failures resulted. Finally a unit was operated successfully in the holloware industry and about the same time high production electric units in the boiler, heater and stove industries. Improvements on the originals later were made and a few were installed in the jobbing, stove, and table top industries. The most adaptable design consisted of a firing chamber with approaches on both ends. The work was conveyed through the furnace by an overhead chain, carrying tooled hangar rods through a slot in the roof. With this single pass, warm air from the burned work was drawn from the cooling approach and recirculated in the opposite end to dry and preheat the incoming work.

Production Is Increased

Soon a double chain was included in the same type of furnace and two lines of work moving in opposite directions were being burned successfully. Here a marked improvement was made. Outcoming work at high heat passed the incoming lines and there was a direct transfer of heat, which greatly reduced the fuel cost and speeded up the chain, which meant greater production.

Next came the U-type of continuous furnace, which produced considerably more work with a low fuel cost. It essentially is a large box type furnace with the door removed and with a double wall approach for 40 or more feet, fitting flush against the front. A flat slab roof is built over the full length of furnace and approach. A slot cut through this roof to one side of the center line extends toward the back wall, turns 180 degrees crossing the center line to an equal distance on the opposite side, and then proceeds back to the far end of the approach. A chain operates above this slab roof and directly in line with the slot and extends out for a convenient distance on the front of the approach. Rods suspended from the chain travel through the slot. After the furnace is brought up to heat, ware to be burned is hung on the rods, and the chain placed in motion.

The ware gradually travels through the muffle and toward the back of the furnace where it rounds the curve and proceeds back in the direction whence it came. On reaching the front end of the approach, it has completed the burning operation. After leaving the burning chamber, the work begins to cool, and since it is traveling directly in parallel, but in opposite directions with the incoming

work there is a direct heat transfer, resulting in the unburned ware reaching the firing chamber at a higher temperature and the burned ware at a lower temperature.

The walls of the burning zone are built of 9-inch low conductivity shale brick, 13½ inches of properly balanced high-grade insulation, and 18 inches of high-grade fire brick. Heavy fire clay slabs covered with 6 inches of insulation and supported by alloy studs and plates from overhead steel work cover the roof. The center section between the slots is suspended.

Special Refractories Used

The muffle and piers are built of alundum and corundite refractories, properly placed to give even heat distribution throughout the length and depth. With gas-fired furnaces a cross firing principle employing nine or ten burners of high or low pressure, is used in which event the bottom consists of rows of V-bottom tile, running crosswise through the furnace, thus giving maximum radiation from the bottom. If oil-fired, a twin arch bottom with two firing ports in the rear is installed.

Plates carried by the hanger rods slide on structural channels, topping the fire clay slabs and prevent heat loss and keep the ovehead trolley cool. They also prevent contamination of the ware through this slot. Roof construction on the approach or preheating zone is the same as on the furnace. The side walls, are reduced in thickness but fully insulated the entire length. At the front, insulated hinged doors are included on both the incoming and outgoing sides, to keep the opening only large enough to allow the work to pass.

Clean-cut openings are located along side walls and at rear end to remove work falling from the tools, and to facilitate speedy repairs. Automatic recording control is provided. Maximum temperature is controlled from a point in the high heat zone, and thermocouples are installed at convenient locations along the entire length. A ball bearing idler of special design over the closed end insures a smooth running chain free from vibration and allows proper suspension of the center roof at this point.

Chain extension in front of the furnace depends entirely on the plant layout. On most installations the chain proceeds directly out on a straight line for 50 or more feet and then makes a full 180 degree turn, traveling directly back into the furnace. At the turn the overhead drive and take-up is installed.

A drive unit of special design is mounted on wheels and sets on an overhead supporting structure at this point. A 2-horsepower motor, 7:1 speed transmission, spur gear reducer and bevel gear arrangement, drives a 48-inch sprocket, which moves the chain at a variable lineal speed of 5 to 35 feet a minute. An automatic cut-out prevents jamming or any undue load on the chain, and a counter weighted carriage keeps the chain tight.

A chain travel around the entire shop to include operations may be used, but this is a straight conveyor erection problem. On installations to date, this has not been done, since any great travel out of the furnace always allows tools to cool, which means heat loss. Auxiliary conveying equipment with a transfer at the furnace generally is used.

With the closed end, two advantages are gained. With a given length of combustion chamber over twice the chain travel in the burning zone is accomplished by the U-return. This means over double the chain speed on this score alone, or more lineal feet of chain traveling through the furnance per unit of time, which is directly proportional to the production. Moreover, the enclosed end allows dissipation of heat toward only one end and prevents heat loss, due to drafts setup, and gives a longer effective burning distance for the chain to travel. By properly baffling the preheating zone, dissipation of heat in this direction is reduced considerably. With a special flue construction running under the preheating zone floor directly under the incoming work, a much higher chain speed is obtained. Since with any given tool, the square footage possible to load per lineal foot of chain is fairly constant, it is reasonable to assume that any increase in chain speed increases production in direct proportion.

Customer Should Design Tools

Proper alloy tools should be designed by the customer to best suit his work. Too much importance cannot be laid on this point, since maximum efficiency of the furnace is gained by having the lightest tools possible and yet have those capable of carrying the maximum footage of work.

To date three of these U-type fuel fired furnaces are in operation. Two oil-fired on table tops and sign work, and one gas-fired on holloware. The first two can burn 3000 square feet of 18 to 20 gage metal, with an oil consumption varying between 30 to 35 gallons. On holloware 4800 pieces an hour are being burned with about 4800 to 5000 cubic feet of natural gas. By a change in the tooling, this same job soon will be producing over 6000 pieces with an estimated consumption of less than 5500 cubic feet.

This same furnace has been installed with electricity as fuel. The principle is the same, but the burning zone is elevated, thus confining the heat in such a way as to prevent flow-loss through the preheating end. One of these with a 575 kilowatt connected load is producing well over 2500 square feet of stove work per hour. Three more, 150 kilowatt connected load, are producing refrigerator tanks similar to cast iron work, and each averaging over 1000 pounds of work burned per hour.

Steady Operation Desirable

Continuous furnaces cost considerable money to operate, almost as much on part capacity as full capacity. When idling there is a cost not readily calculated, but nevertheless, a considerable amount. Smaller units will come in the gas and oil-fired furnaces. Small electrics have already been installed, but even the small ones produce a large poundage, due to their high efficiency. To make any continuous furnace pay, it must be kept busy the greater part of the day, week and year. Where installed, it is best to figure on keeping a spare box unit, or install an additional continuous unit. Accidents, repairs, etc., are liable to occur at any time, and if the entire shop production is tied up in the one unit, a considerable loss will be incurred. Also by having one or two spare box units available, the continuous furnace may be cut out temporarily at any time, if production does not warrant its operation.

To date this furnace has been applied in burning sheet steel only. Cast iron samples have been burned successfully on trial, but not in production. Basically, this method of operation with a gradual heating and cooling is ideal for cast iron and should prove out better than the results obtained on sheet steel. Units now under construction, however, will soon be available for trial of cast iron.

Talks on New Alloy

Rodger D. Prosser of Thomas Prosser & Son, New York, will speak before the Newark branch of the American Society of Mechanical Engineers, March 19, on the development and application of the new tungsten carbide material, widia. This is a cutting alloy developed by the Krupp Co., Germany, of which Thomas Prosser & Son are American representatives. The meeting will be held under the direction of the machine shop practice division of the society.

New Books Worth Reading

SCIENCE ECONOMICS BUSINESS

Wheeling, A Cradle of Steel

Iron and Steel in Wheeling, by Henry Dickerson Scott; cloth or leather; 176 pages, 8 x 12 inches: illustrated; supplied by IRON TRADE REVIEW for $7.50 in cloth and $10 in full leather, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1 17s 6d and £2 10s, net, respectively.

Since history, especially industrial history, may be written best while the memory of living men reaches back and while material evidence still is in existence, this book is timely as a record of the beginnings and growth of the iron and steel industry at Wheeling, W. Va. Mr. Scott has done a real service in collecting and verifying his information while opportunity existed. That the book has been handsomely illustrated, printed on fine paper and substantially bound adds to its value and to its longevity. Future historians of the industry will find here much to aid them in their broad view of the American steel industry.

Mr. Scott is an official of the Wheeling Steel Corp., a son of I. M. Scott, its president. Preparation of the material was a labor of love on his part and in the interest of accuracy he has given his sources and carefully noted when it was not possible to verify the apparent facts.

Wheeling in an early day marked the head of practicable navigation on the Ohio river and the point of crossing of the Cumberland or National road. This gave it prominence and aided in attracting capital for the support of industry. Rivalry with Pittsburgh was strong for many decades. The city never became strong as a producer of the heavier forms of steel, but in nails and sheets and the lighter finished forms it early took a strong position, which has continued.

The writer has traced the growth of the iron and steel industry in the Wheeling district from the earliest plant in 1832, built by Dr. Peter Schoenberger and David Agnew. The former had built the Juniata plant at Pittsburgh in 1824, which later became the Schoenberger works of the American Steel & Wire Co. The latter made the first commercial use of Lake Superior iron ore in blast furnace at Sharpsville, Pa., in 1853. The Wheeling district had among its active ironmasters many who were also known more widely. John A. Topping of the Republic Iron & Steel Co., F. W. Oglebay of Oglebay, Norton & Co., iron merchants, S. H. Woodward, later of the Woodward Iron Co. in Alabama, and others.

A bibliography records the sources from which information was obtained and indicates the thorough search for facts.

* * *

Education for the Worker

Public Schools and the Worker in New York, cloth, 80 pages, 6 x 9 inches; published by the National Industrial Conference Board, New York, and supplied by IRON TRADE REVIEW for $1.50, plus 15 cents for postage.

A survey of public educational opportunities for the industrial worker in New York is presented in this volume. The purpose is to outline the public educational facilities provided by New York state which have some direct bearing on the preparation of young people for industrial and commercial occupations. No attempt is made to present a critical evaluation of these facilities, either from the viewpoint of educational science or the special interests of employes.

* * *

Making Fuel Better

The Cleaning of Coal, by W. R. Chapman and R. A. Mott; cloth, 680 pages, 6 x 9¾ inches; published by Chapman & Hall Ltd., London; supplied by IRON TRADE REVIEW for $11.20, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 42s, net.

With the coal industry actively interested in the subject of removing dirt from coal as a measure of economy the appearance of so exhaustive a text is most timely. All present methods of cleaning coal are fully described, from both theoretical and practical aspects. The book deals with the history, practice and economics of coal cleaning, methods of testing and controlling washeries and the advantages of clean coal in various industries. Since coal cleaning offers the most immediate and direct means of increasing the value of coal the importance of the subject is great.

Illustrations and diagrams are used profusely to show construction of cleaning devices and their operation. Tables of data give results obtained from various processes.

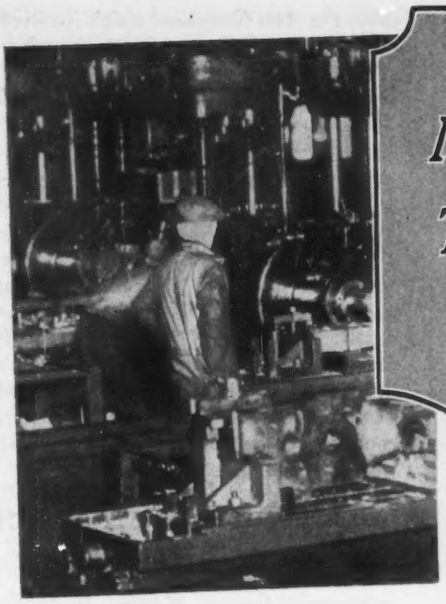
* * *

Cast Iron Exhaustively Treated

Die Betriebspraxis der Eisen-Stahl- und Metallgiesserei-Heft 7-Die metallurgischen und metallographischen Grundlagen des Gusseisens, by K. von Kerpely, paper or cloth, 120 pages, 6½ x 9½, published by Wilhelm Knapp, Halle (Saale), Germany, and supplied by IRON TRADE REVIEW for $3 in paper or $4 for cloth, plus 15 cents for postage. In London the book may be obtained from Penton Publishing Co. Ltd., Caxton House, Westminster, for 15s in paper and 20s in cloth binding.

This volume is the seventh of a series covering works practice in the iron, steel and metal foundry, compiled under the direction of Hubert Hermanns. It relates to the metallurgical and metallographic foundations of cast iron. Chapter I is devoted to a discussion of the structure of cast iron with numerous diagrams and illustrations. Chapter II describes the influence of silicon, manganese, phosphorus and sulphur upon the structural properties of cast iron and refers to the work of such investigators as Gontermann and Oberhoffer, Honda and Murakami, Heyn and Bauer, Wuest and Peterson, Hatfield, Hague and Turner, and many others. In chapter III the author discusses the origin and influence of graphite on the structure of cast iron. Reference is made to the work of Tamman, Goerens, Heyn, Northcott, Hailstone, and Piwowarsky's investigation of the effect of high temperature melting. Meyer's further investigation of Piwowarsky's process is mentioned. Chapter IV is devoted to the influence of some elements upon

(*Concluded on Page* 721)



New Machine Tools and Shop Equipment

"Without tools man is nothing, with tools he is all."—Carlyle

Builds Bench and Floor Type Grinders

No. 58

Kling Bros. Engineering Works, 1300 N. Kostner avenue, Chicago, announce a new line of small high-speed grinders in either the bench or floor type. They are made with the cast frame of semisteel, cored construction. Wheel shafts are 0.40 per cent carbon steel finished all over and fitted with double row radial ball bearings. Chucks are made of cast steel finished and balanced. Wheel guards are of fabricated steel, conforming to the American engineering standards safety code. Bearings are of the labyrinth type and fully enclosed. Drive pulley is rubber covered to prevent slippage.

These units are made for use with 18x2x7 rubber bonded or bakelite grinding wheels for high-speed rough grinding and snagging. They operate with a peripheral wheel speed of 9000 surface feet a minute. Because of the high speed of the wheels and the rugged construction of the unit, the manufacturer makes claim of maintenance-free operation, quick grinding, maximum wheel efficiency and lower cost per pound of metal ground.

Many New Features on Traveling Crane

No. 59

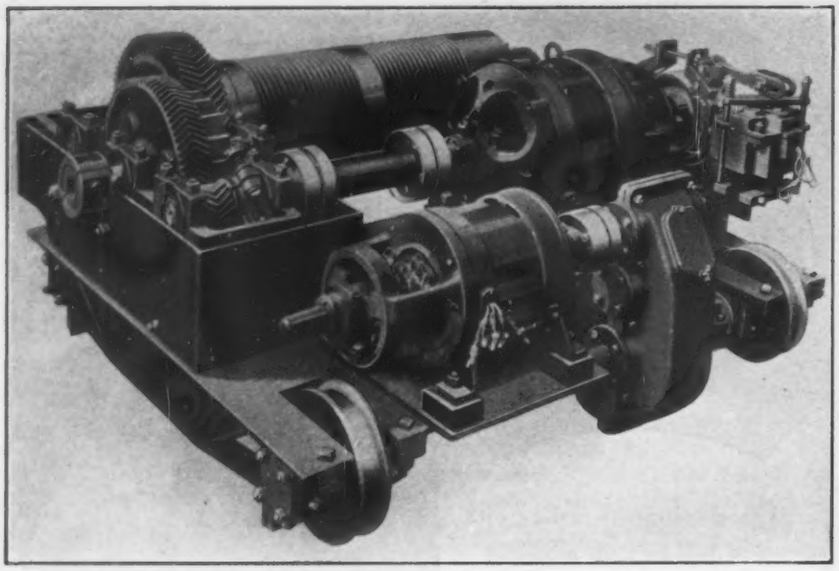
Whiting Corp., Harvey, Ill., is marketing a new type crane designed with herringbone gears. These are cut from hollow steel blanks without grooves or center notch. Roller bearings of the Hyatt type have been adopted. The entire hoisting mechanism including mechanical brake and drum gear, is enclosed in an oil-tight, welded steel casing.

The truck or trolley travel gearing and the bridge drive gearing also are enclosed and operate in an oil bath. Axle and squaring shaft bearings are lubricated by a high-pressure grease gun. All parts are machined to jigs and dies, making them interchangeable. Many safety features have been incorporated in the design. A broad footwalk with upturned sides extends from end to end on the driving side. All gears are enclosed.

Automatic brakes, an automatic limiting device to prevent over-travel of the hook, a fully enclosed switchboard with suitable locking device, and rail guards for the wheels also are provided. By the use of herringbone

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date Described	Page
Cutting machine	Oxyacetylene unit for curved and straight cutting	Air Reduction Sales Co.	36	Feb. 21	528
Grinder	Ball bearings; fine and coarse wheels	United States Electrical Tool Co.	37	Feb. 21	529
Compensator	Exposed sparking eliminated by new contact method	General Electric Co.	38	Feb. 21	529
Buffer	Performs polishing and buffing operations	Hill-Curtis Co.	39	Feb. 21	529
Relays	New line of temperature overload relays	General Electric Co.	40	Feb. 21	529
Indicator	Detects presence of combustible vapors in air	Union Carbide Sales Co.	41	Feb. 21	529
Floor armor	Steel mat for reinforcing concrete and asphalt floors	Blaw-Knox Co.	42	Feb. 28	591
Welding rod	High-strength welding rod for bronze welding operations	Oxweld Acetylene Co.	43	Feb. 28	591
Grinder	Heavy-duty type; duplex tables may be uncoupled	Cincinnati Grinders Inc.	44	Feb. 28	592
Compressors	Eleven models ranging from ¼ to 5 horsepower	Curtis Pneumatic Machinery Co.	45	Feb. 28	593
Electrode holder	Water-cooled; for use in manual carbon arc welding	Lincoln Electric Co.	46	Feb. 28	593
Grinder	Equipped with attachment for grinding large cams	Norton Co.	47	Feb. 28	593
Screwnail	For fastening sheet metal and wood; driven in	Parker-Kalon Corp.	48	March 7	651
Crank grinder	Work need not be removed to grind crankshaft pins	Landis Tool Co.	49	March 7	651
Generating set	Diesel engine connected to 40-kilowatt generator	Buda Co.	50	March 7	651
Drill	For drilling, burring or countersinking; dial plate feed	Kent Machine Co.	51	March 7	652
Acetylene generator	Used with low or medium pressure welding blowpipe	Oxweld Acetylene Co.	52	March 7	652
Clutch	Automatic and mechanical accelerating type	Worcester Polytechnic institute	53	March 7	652
Magnetic probe	To remove steel particles from flesh or eyes	V. Mueller & Co.	54	March 7	652
Grinding machine	Universal type with reversible wheel stand motor	Brown & Sharpe Mfg. Co.	55	March 7	653
Grinder	Swing frame type for foundry snagging work	Kinney Iron Works	56	March 7	653
Pouring device	Hand operated; ball bearing equipped	Modern Pouring Device Co.	57	March 7	653
Grinders	Small high-speed units; bench or floor types	Kent-Owens Machine Co.	58	March 14	719
Crane	Improved lubrication; numerous safety features	Gleason Works	59	March 14	719
Tractor crane	Increased flexibility and greater capacity	American Hoist & Derrick Co.	60	March 14	720
Nut tightener	Auxiliary clutch said to prevent ratcheting and jerking	Independent Pneumatic Tool Co.	61	March 14	720
Hoist	Mounted on 5-ton truck; gasoline motor drive	Otis Engine Corp.	62	March 14	720
Gear cutter	Hypoid head handles gears 60 inches in pitch diameter	Whiting Corp.	63	March 14	720
Milling machine	Provided with combination power and manual feeds	Kling Bros. Engineering Works	64	March 14	721



No. 59—Trolley mechanism of traveling crane, with gear cover removed

gears the necessary speed reductions are obtained with two gear reductions instead of three. This means fewer parts and a much more compact trolley.

The structural members composing the arch-bar trolley frame are welded together, forming one-piece construction of maximum strength. The hoisting mechanism is enclosed in a welded steel casing. The hoist gearing and the mechanical brake are mounted on a steel casing, placed inside of the welded gear case and bolted to the trolley frame.

Design of Tractor Crane Gives Flexibility

No. 60

Otis Engine Corp., 130 Clinton street, Brooklyn, N. Y., has developed a new type of tractor crane mounted on a McCormick-Deering tractor. This, it is said, will enable the company to offer a crane of more than double the capacity of its former model. It is, however, designed under the same basic patterns. The flexibility which this crane is claimed to have, will permit travel over uneven roads without undue strain to the framework and unnecessary risks to the operator. It is designed to eliminate excessive weight on the front axle to make steering easier.

Kickout Nut Tightening Device Is Announced

No. 61

Independent Pneumatic Tool Co., 600 W. Jackson boulevard, Chicago, is marketing a kickout nut tightening attachment. This attachment is provid-d with an auxiliary clutch which operates under spring tension when a certain torque is applied to the front end of the attachment. When the nut is driven to this tension the auxiliary clutch disengages and lifts itself off on a cam. This permits the front end of the attachment to remain stationary for one revolution before the auxiliary clutch again is engaged, during which time the operator has ample opportunity to pull the machine away from the nut. This eliminates ratcheting and jerking. The attachment is adjustable so as to take care of a variation of sizes of nuts and bolts and is made in several sizes. It will drive any nut or bolt from $\frac{5}{16}$-inch up to 1½ inches diameter. The unit is enclosed by a sleeve extending over the two clutches which protects all moving parts from dust or grit.

Silent Chain Drive on Gasoline Hoist

No. 62

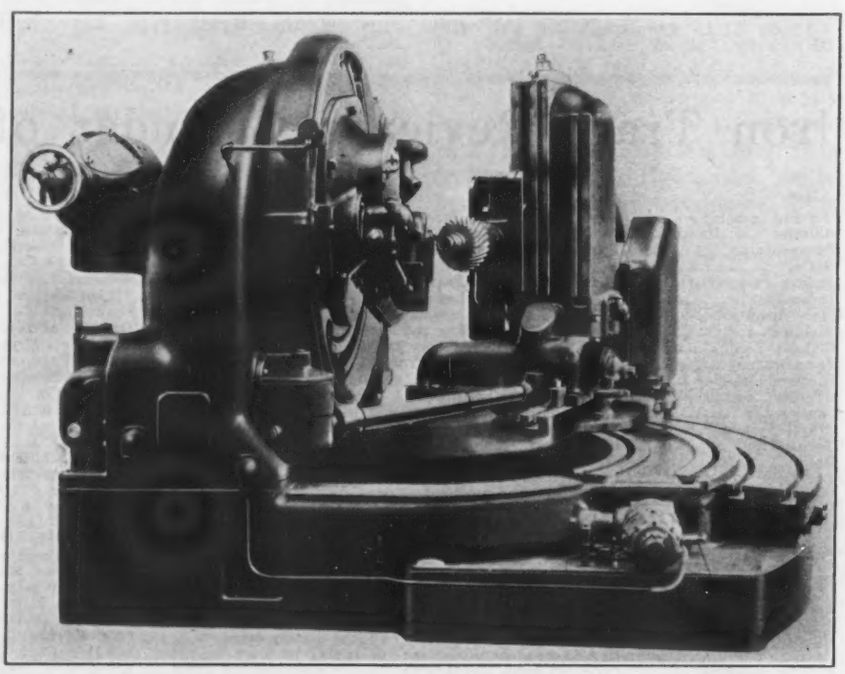
American Hoist & Derrick Co., 63 S. Robert street, St. Paul, has placed on the market a newly designed hoist. It is driven with a Waukesha gasoline motor. The power is transmitted to the hoist by a silent chain drive and is delivered to what would be the crank shaft on a steam hoist. Mounted on a 5-ton truck, this hoist constitutes the power plant of a portable dragline installation.

Gear Generating Machine Has Hypoid Head

No. 63

Gleason Works, Rochester, N. Y., has developed a large gear generating machine designed for spiral bevels with the addition of a special work head for cutting spiral pinions. Besides the usual adjustments of the spiral bevel gear head the hypoid head has two others. The work spindle can be offset vertically above or below center, so that the pinion can be cut in the same relative position in the machine as the position in which it is run with the mating gear. A small horizontal, transverse adjustment of the head also is provided.

The hypoid head can be used for cutting hypoid and spiral bevel pinions and gears of small pitch diameter. Approximate maximum dimensions of gears which can be cut



No. 63—Gear generating machine equipped with hypoid head

by the hypoid equipment are: 60-inch pitch diameter, 30-inch cone distance, 8-inch face width, 1½ diametrical pitch, zero to 25 degrees spiral angle, ratios between 1:1 and 1:10, and 10-inch vertical offset.

Manual and Power Feeds Provided on Miller

No. 64

Kent-Owens Machine Co., Toledo, O., recently introduced a combination hand or power feed miller. In using this machine the operator has at his disposal a combination manual and powerfeed arrangement. In either case the quick return is by hand. This permits a rapid transverse of 600 to 700 inches a minute.

The power feed is operated by a lever at the front right of the machine. Adjustable trip dogs on the side of the table automatically engage and disengage this feed. The head may be fed vertically by hand. It is counterbalanced by a weight hanging inside the column.

The table is 25 x 14 inches overall and has two ¾-inch tee slots. The maximum distance from the spindle to the surface of the table is 17½ inches. Roller bearings on the spindle and backshaft permit high speeds necessary for small diameter cutters and for properly milling aluminum, brass and other soft materials as well as for the use of carboloy and similar tools. The machine may be arranged for either belt or motor drive.

Book Reviews

(*Concluded from Page* 718)

the structural properties of cast iron, and relates the investigations carried on by Sipp and Diefenthaler on pearlitic cast iron, the work of Maurer and that of Greiner and Klingenstein. Reference also is made to the effect of titanium, aluminum, manganese, nickel and chromium. Chapter V deals with the mechanical properties dependent on structure and treatment. In chapter VI the author discusses shrinkage, and chapter VII the growth of cast iron.

* * *

British Electrical Practice

Mechanical World Electrical Pocket Book, 326 pages, 4 x 6 inches, cloth; published by Emmott & Co. Ltd., London, and supplied by IRON TRADE REVIEW for 85 cents, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 1s 6d, net.

This is an annual publication of electrical information in handy form for ready reference. An unusually large amount of new matter has been included this year. Sections have been introduced on electric winders for collieries, electric driving in steel works and turbo-alternators, including flywheel alternators. Much of the earlier editions has been rewritten to bring it down to date. Other additions include a section on automatic substations, data relating to condenser calculations and various new tables of miscellaneous nature.

* * *

Electric Furnace in Industry

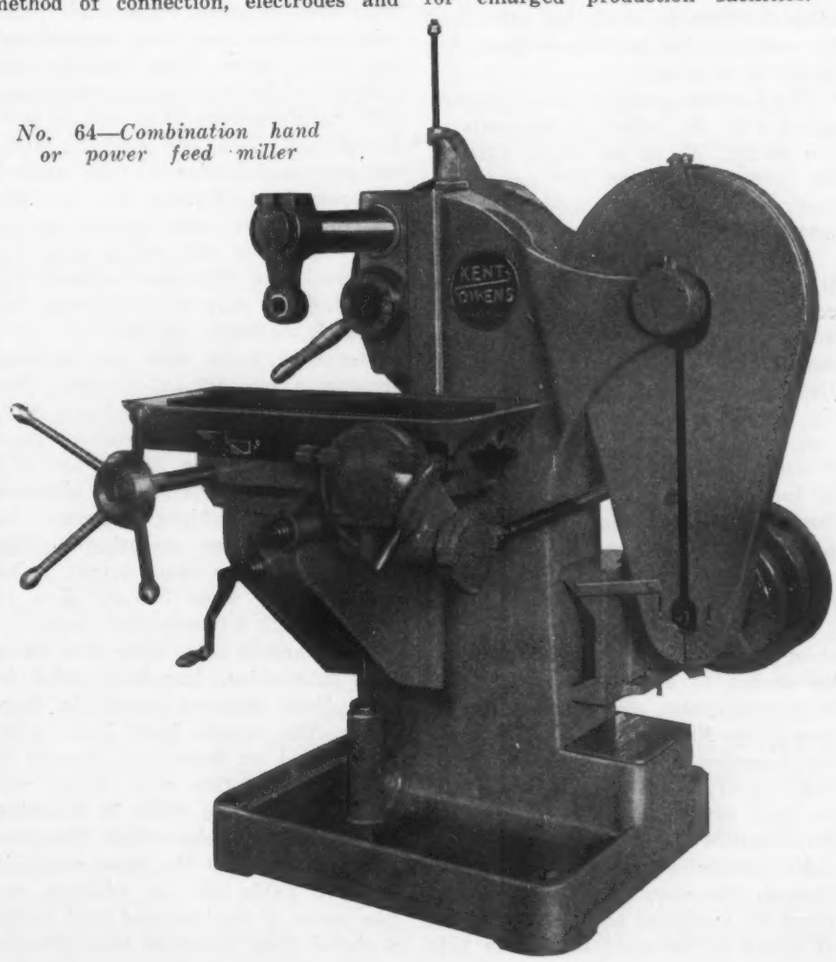
Technische Elektrochemie—IV Band —Elektrische Oefen, by Dr. Jean Billiter, paper or cloth, 302 pages, 6½ x 9¾ inches, published by Wilhelm Knapp, Halle (Saale), Germany, and supplied by IRON TRADE REVIEW for $6 in paper and $7 in cloth, plus 15 cents for postage, and in Europe by Penton Publishing Co Ltd., Caxton House, Westminster, London, for 30s in paper and 35s in cloth binding.

This volume is Part IV of a series, "Technical Electrochemistry," dealing with electrochemical processes of the chemical industry, their principles and exploitation, and is devoted to electric furnaces. The introduction deals with the characteristics of the most common types of electric furnace in use and covers resistance, arc and induction furnaces, kind of current available, method of connection, electrodes and their introduction into the furnace and attachment to the distributing cables. Chapter I deals with the production of carborundum and artificial corundum. Artificial graphite production is discussed in chapter II. The production of phosphorus carbon disulphide and calcium carbide are described in chapters III, IV and V. In chapter VI the author deals with the application of the high tension arc in the oxidation of nitrogen to form various compounds. Chapters VII and VIII describe the production of aluminum nitride and the conversion of cyanamide into cyanide, and the manufacture of hydrocyanic acid and cyanides. Chapter IX contains additions and supplementary matter regarding the processes previously discussed.

Hanna Earnings Increase

Earnings of the M. A. Hanna Co., for 1928, after all charges, before dividends, amounted to $2,231,221 compared with $1,112,957 in 1927. Operating profit of the company was $4,525,341 in 1928 against $3,005,475 in 1927.

Silver King Hydraulic Jack Co., Cleveland, has leased additional space at 5602 Carnegie avenue, Cleveland, for enlarged production facilities.



No. 64—Combination hand or power feed miller

New Alloy Steel Gleams Like Polished Silver

(*Concluded from Page* 711)

trips to Essen to obtain complete information."

The Krupp Nirosta Co. Inc., according to Mr. Batcheller, is not simply a patent holding, but is principally a service company to insure intelligent manufacture and marketing. One of the primary purposes is to restrict the marketing of the chrome nickel series of alloys within its limitations and to prevent these alloys from being sold for purposes to which they are unsuited.

The company now has under negotiation plans whereby additional licenses will be granted, or plans of present licensees or sublicenses will be amplified, so that chrome nickel steel will be available in every finished form.

Three companies, the Central Alloy corporation, Ludlum company and Babcock & Wilcox company, have made joint arrangements to familiarize prospective users with the full possibilities of the steel. A feature of this co-operative work will be the maintenance of three exhibits, including tableware, mirrors, dental and surgical tools, automobile parts and cutlery. One of these exhibits will be permanently on view in New York and another in Chicago, while the third will be available for movement from one point to another.

The Ludlum company also is closely allied with the latest developments of the Krupp Works at Essen, through its license agreement for the manufacture of tungsten carbide cutting material.

Patents of the Krupp interests and those of the General Electric Co., covering this metal have been merged under the Carboloy Co. Licensed to manufacture the material in the United States are the Ludlum Steel Co., which will market it under the name "Strauss Metal" and the Firth-Sterling Steel Co., which will market it under the name "Dimondite." The foreign made material has been imported by Thos. Prosser & Son as "Widia," which means "like a diamond."

Ludlum company is preparing to erect a model plant at Watervliet, its design to embrace the teachings of several years manufacture on the part of the Krupps, who have supplied the tungsten carbide tools to practically every industry in Europe, and the long experience of Ludlum in the manufacture of tool steels.

Mill facilities have been increased through the acquisition of the Atlas plant at Dunkirk, and now the list of products increased to include both the corrosion and the heat resisting Nirosta, steel, the wear-resisting Nitralloy, and the tool steels supplemented with Strauss metal.

Saar Industry Expands Under France

(*Continued from Page* 715)

dropped to from 13 to 15 per cent. Coming out of the furnace, this semicoke, which is at a temperature of about 500 degrees Cent., is immediately mixed with the bituminous coal, the heat of the semicoke being thus used to partly dry the fresh coal. This drying and mixing process is effected at the back of each oven in a drum containing two worm-screws and a crusher, the bituminous coal falling from a hopper. The mixture then is conveyed to the coke ovens, and during transportation the mixture becomes more intimate, which factor is a condition of success. At the distillating plant tests are made every hour to control the contents of volatile matter remaining in the semicoke. During the process, tar and heavy oils are formed, collected, and marketed. One furnace yields 30 tons of semicoke per day.

The coke oven plant proper is composed of three batteries of 30, 60 and 30 by-product ovens, respectively. The height of the ovens is 2 meters and the width varies from 0.43 to 0.56 meters. Coke can be manufactured with the bituminous Saar coal, or with the mixture of coal and semicoke, without any modification to the method of operation. During the writer's visit, one battery was working partly with coal alone and partly with the mixture. The difference between the two kinds of coke produced was immediately visible to the eye.

The coke made with the mixture presents a compact appearance. The shatter test figure on 2 inches is 80.0, as against 64.5 for the ordinary Saar coke; on 1 inch the figures are 97.3 and 86.0, respectively. The abrasion tests also show higher figures. In addition a battery operating on the mixture gives the same output in 24 hours as the same battery does in 28 hours with ordinary Saar coal.

The improved coke, after first being used in cupolas, has been tried in large blast furnace stacks in Lorraine. The results have been satisfactory and an increasing demand is developing for this coke, which will assist the Lorraine works in becoming independent of Ruhr coke. The production of coke at the Saar mines is given in Table III. In addition, the coke ovens of the iron and steel works produced from imported coal approximately 2,000,000 tons in 1928, which shows that the output of the mines is only about 13 per cent of the total. Of the coke manufactured at the mines and sold in 1927, about 45 per cent was consumed in the Saar both for industrial and domestic purposes, 29 per cent went to Italy, 20 per cent to France, 4 per cent to Switzerland, and the balance to Germany, Belgium and Luxemburg, and other countries.

(*To be Continued*)

Molds Enamel Ware on Continuous Units

(*Concluded from Page* 712)

The frit is removed to a rotary drier, which is heated by gas and makes 12 revolutions per minute, thus permitting the frit to be dried thoroughly without burning. This is shown in Fig. 2. The dried frit then is placed in pebble mills approximately 5 feet in diameter and revolving about 26 revolutions per minute. The mills are of steel and cast iron construction and lined with white porcelain brick. The frit is loaded into these mills with white porcelain pebbles about 2½ inches in diameter. The revolving motion of the pebble mills grinds it into a fine enameled powder.

The powder is sifted through an exceedingly fine mesh screen, placed in containers made of sheet iron and is ready to be delivered to the enamelers. The slush or base coat previously referred to is mixed and melted in approximately the same manner as is enamel. It is placed in a mill similar to the one used for grinding enamel frit and with the addition of water and other ingredients in the mill, slush is produced in liquid form for direct application. This slush or base coat holds the enamel to the cast iron.

After the enameling process is complete, the ware is put in a cooling oven of brick construction which is large enough to hold only a single casting. When sufficiently cool to permit handling with gloves, the piece is taken from the cooling oven and delivered to the inspection department. When it has cooled completely, it is inspected and taken to the wareroom. It then is ready for the outside coat of paint. This is done with a spraying outfit operated with compressed air. When the paint is thoroughly dry, the piece is crated and is ready for shipment.

The Richmond Radiator Co. also makes coal fired boilers at its Norwich, Conn., plant and radiators and gas boilers at its Uniontown, Pa., plant. These plants are operated apart from the enameled ware unit.

Editorials

Would End Abuses in Scrap

THE first annual convention of the new Institute of Scrap Iron and Steel which was held last week in New York already stands out as a landmark in the history of the scrap business in recent years. It was plain at this meeting that scrap dealers do not believe that they are responsible for all of the abuses in the scrap industry. They hold consumers, and particularly steel companies, responsible for at least some of them. The dealers assembled decided to give the whole industry a thorough scouring. Application will be made to the federal trade commission for a hearing, which is to be scheduled sometime after May 1, and at that time an attempt will be made to eliminate abuses and set up a code of ethics to govern the business in scrap.

Despite its newness, the institute received from its members a marked indication of confidence, in the form of a unanimous vote in favor of compulsory arbitration of all disputes between members of the institute. This vote was registered after a lengthy discussion, during which those present were fully assured that from the decisions of the institute's arbitrators there could be no recourse. By their vote, the members, in showing their confidence in the institute, also indicated their confidence in each other, which is a new kind of manifestation in the scrap trade.

There were many other developments. One of them was the decision to appoint a committee to study the insurance situation, with a view to organizing a mutual company by which the dealers will carry their own insurance. Another was the decision to study costs in conducting a scrap business. An important feature of the convention was a suggestion that scrap yards which are useless and wage destructive competition against each other be merged.

It is apparent that though it took the industry a long time to organize, it finally is organized. If the present plans are carried out, great changes no doubt will develop in the scrap business as it has been conducted hitherto. Possibly some changes may not be welcomed in all directions. Possibly some mistakes may be made. On the other hand, the work in which the new institute is engaged is a wholesome manifestation of the desire of an industry to eliminate abuses and to bring about conditions which will enable its members to do business at a legitimate profit. As to the sincerity and high-minded purpose back of the institute's program, the general tenor of the utterances at last week's convention left no question, so that consumers of scrap have every reason to encourage the work of the institute.

New England Meshes with Detroit

MACHINE tool makers and metalworking shops of central Massachusetts and Rhode Island are comparably as active as the main stem of the iron and steel industry, and largely for the same reason. It is the automotive industry's demand for raw material that has spurred iron and steel production to record heights, and to finish these materials New England equipment plays no small role.

An important maker of twist drills is sold up two months. A grinding equipment interest is troubled making deliveries. Rhode Island makers of machine tools are even busier, in cases, than those of Massachusetts. A secondary reaction is capacity operations at a plant making filling-station equipment. No small impetus is coming from the reviving demand for textile machinery from New England as well as the South.

New England may be some hundreds of miles removed from the center of the automobile industry, yet a large proportion of its activity is closely geared in with the assembly lines at Detroit.

Steel Records Taken for Granted

IN FEBRUARY the steelmaking capacity of the country was operated at the highest daily rate in its history. Over January, the 180,198-ton rate of February was an increase of 8 per cent; over last February 12 per cent; over the previous alltime high of last October 4½ per cent; and over the peak of the war effort 18 per cent. But so blase has the industry become to new records that its only response is to make still more steel.

Making records as well as steel seems to be one of the functions of the industry. Since 1923, with the single exception of 1925, no high mark has stood longer than a year. April, 1923, saw a new level reached, only to be eclipsed in March, 1924.

This high mark stood until March, 1926. Then came a super-effort in March, 1927, followed by further ones in April and October, 1928, and now another in February, 1929. And judging from

the opening ten days of March, the February record will stand just about one month.

How long can this pace be maintained? Just so long as the desire of the country as a whole for better living is expressed in steel. The fact that demand for steel is not artificially stimulated—though effort in this direction is needed—makes these records the more noteworthy. Makers of sheets and strip, and some progressive fabricators, are urging broader application of steel. But the industry is doing little and can do little to stimulate the sale of automobiles, freight cars, line pipe and the other major outlets for its products.

Charles M. Schwab was thought far-sighted—indeed, some were not that charitable—when he first talked of a 50,000,000-ton steel year. Last year that prediction was realized. Now the industry is operating at an annual rate of over 55,000,000 tons annually, not including electric or crucible steel, and there is no particular excitement. It will doubtless be the case that not until the industry experiences a letdown will the significance of a daily rate of over 180,000 tons of ingots be fully appreciated.

Can Pig Iron Stand Prosperity?

IN THE face of price advances in a number of semifinished and finished steel products and raw materials, pig iron barely has been able to hold its own. Valley quotations today, in fact even with the current slightly stronger tone, are lower than at the opening of this year. On the other hand, coke has advanced 25 cents to the highest level in more than a year, predictions are heard of higher prices on iron ore for the coming season, scrap is much stronger than a year ago and quotations of various steel products have increased from $1 to $2 a ton.

Operations of merchant blast furnaces in the valley are at a higher rate than was true a year ago, and few stacks are idle. Despite a good demand, however, the potential supply when enhanced by offerings of steelworks interests, appears too large to effect the substantial price strengthening recently witnessed in scrap and semifinished steel. Competition for tonnage regularly has resulted in either a soft market or an unchanged one.

The merchant producer on occasions has blamed the steelworks for shaded prices. When the latter are well engaged in steelmaking operations and have less iron available for the market, however, merchant sellers have been found equally guilty in the matter of accepting lower priced orders, although some mills have sufficient pig iron producing capacity to permit them always to be a factor in the market.

The current outlook in pig iron is favorable for an upturn in prices. Practically all furnaces have been shipping iron as fast or faster than it is being produced. Some are well booked for a number of weeks ahead. Prospects for a continuation of recent strong demand through the spring months is bright. The advance in coke should prove a strengthening factor. In view of the large number of merchant stacks now in blast, the future course of prices seemingly will depend upon whether or not individual producers are willing to sacrifice their margin of profit for additional business. Competition becomes an important factor when supply and demand approach a parity.

Looking Forward in Steel

HOW much steel per capita will Americans consume in 2000 A. D.? Can the future be forecast from the past? How far will the law of diminishing returns act in restricting the increase per capita of steel use?

Population experts vary in their forecasts of population at the turn of the next century. From the present 120,000,000 Americans some prophets see 240,000,000 in 2000 A. D. while others figure the best population at that time will be 185,000,000.

Fifty years ago, in 1878, with the population 47,000,000 the per capita consumption of steel was 34 pounds. In 1926 the population was 120,000,000 and the per capita steel consumption 959 pounds. But in 1916 it was 950 pounds and in intervening years it has varied above and below the latter. Apparently the steady increase has been checked.

Steel ingot production in 1928 was about 50,000,000 tons and steel castings added more than another million tons. Population of 185,000,000 would be about 50 per cent gain, and on the same basis as in 1928 would call for an annual output of 75,000,000 tons of steel, which does not seem too great to expect in view of the growth of tonnage in the past 50 years. Should the other estimate, 240,000,000 persons, prove true, steel requirements, on the 1928 basis, would be close to 100,000,000 tons, still not an impossibility.

But perhaps increased use of alloys to make steel stronger, pound for pound, lessening tonnage for the same work, may cut into this total materially. Perhaps use of other alloys, those of aluminum or some of the now rare metals, may reduce requirements of steel per capital below the proposed rate of growth.

What has happened in the past 50 years makes the prophet for 70 years hence believe his most roseate dreams for tonnage may be far outdone by the reality.

IRON TRADE REVIEW

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E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

New Chromium-Nickel Steel Has Highly Lustrous Surface. Page 710.

IF YOU are a manufacturer, and in a keenly competitive market, how can you succeed most directly and effectively in putting quality in your product? An answer to this question is suggested in the leading article in this issue, describing the experiences of a company making nuts and bolts. Briefly expressed it is: "Go back to your men—the men who make the products. Get their support and co-operation." How the company did this is told in the article. The guild spirit, it seems is not dead, but dormant; it can be revived. Exacting requirements can be met, this manufacturer found, by dealing frankly with employes.

The Readers' Page

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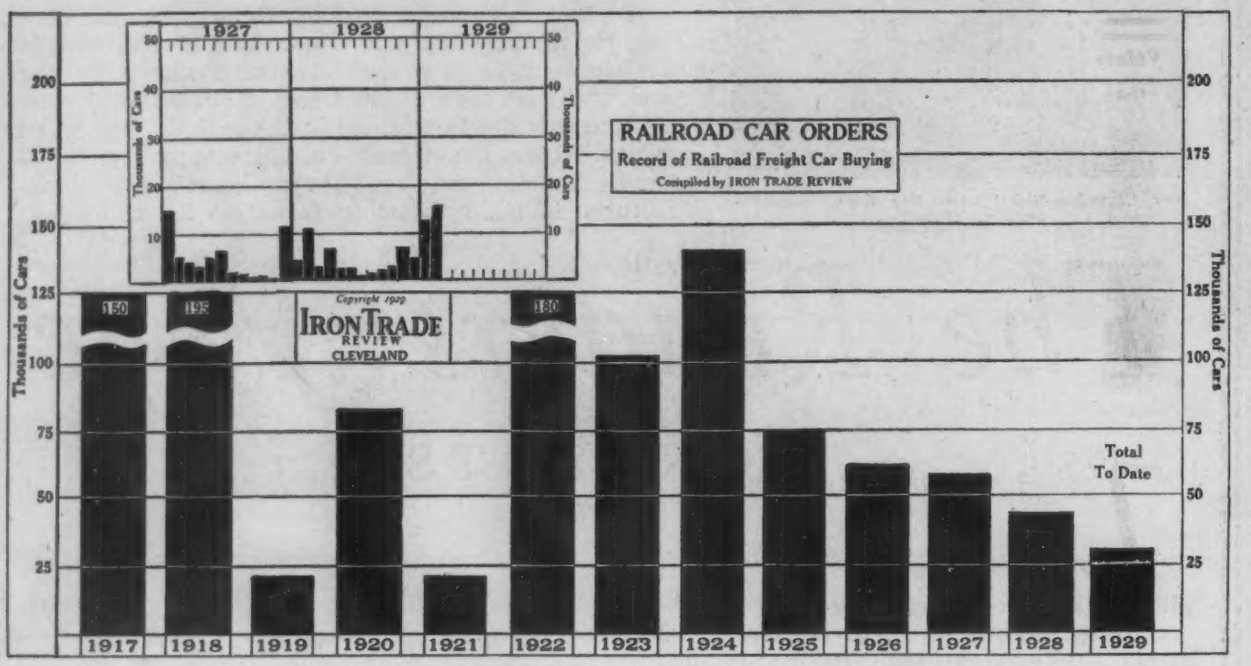
The Business Trend



Steel Industry's Records Imposing

By JOHN W. HILL, Financial Editor

ONE of the most impressive records pertaining to the iron and steel industry since the beginning of the year is that of car buying by the various railroads. During the month of February awards for 15,944 miscellaneous cars were closed. The total for the first two months of the year was 29,140 compared with 44,700 in all of 1928. During the first week of March 6550 additional cars were purchased.

BOOKINGS of new freight cars in February were the largest since 1924. The January and February total is the largest for any two consecutive months since November and December, 1924. Buying by the railroads has been one of the weak spots in the iron and steel markets for the last few years. It now seems that 1929 is to bring an important correction of this unfavorable condition.

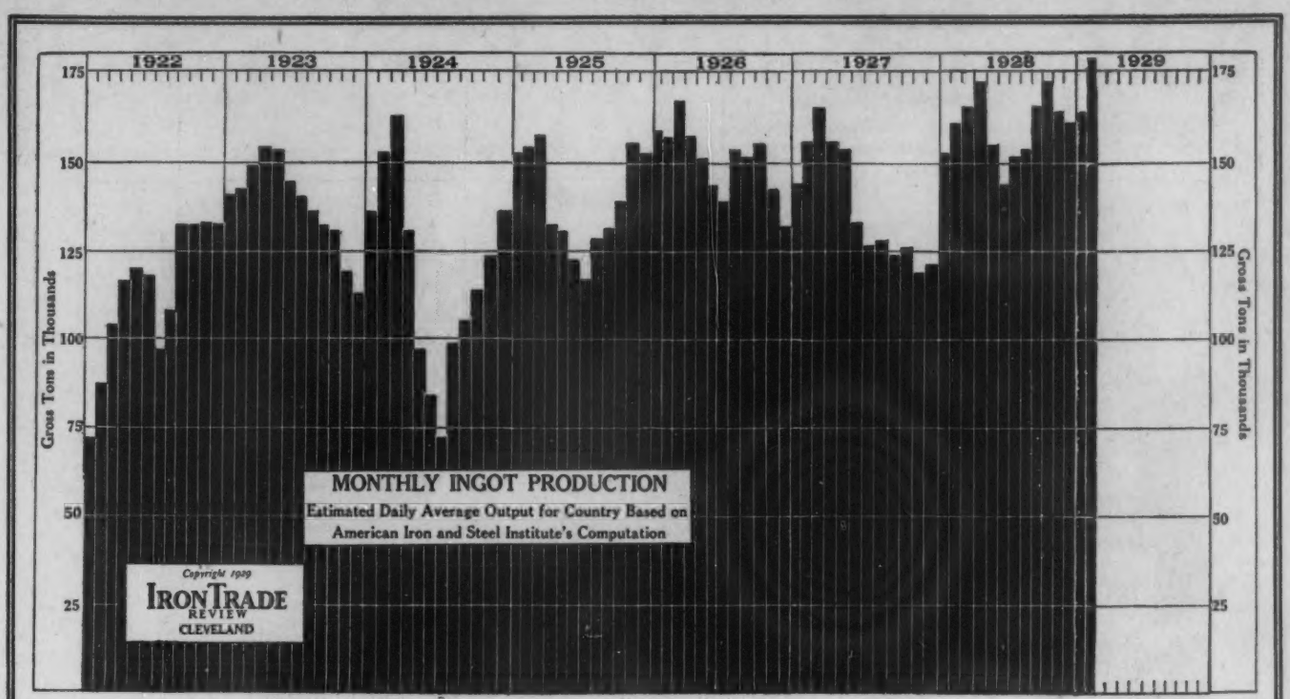
GOOD demand from the railroads is helping to offset some lessening in building construction, although steel requirements are heavy for many large projects. On the whole, consumption of iron and steel products is at an extraordinary level, and the strength of quotations reveals underlying strength in the market.

STRIKING indeed was the record of production of steel ingots in February, with a daily average rate of 180,198 tons. Never before did the industry operate at so high a rate as 95.59 per cent as it did during the month. Output during the month was at the annual rate of more than 55,000,000 tons, and reflects the country's great and expanding requirements for steel.

PIG iron production increased also, going to a daily rate of 114,942 tons and making a new high record for February. The annual rate of pig iron output was 41,914,045 tons in February. During the month six additional blast furnaces were started in operation, making 208 furnaces in blast at the end of month compared with 202 at the beginning.

HIGH production levels for iron and steel have been stimulated by a demand that is of extraordinary proportions. Of the great steel consuming industries that of automobile production is making the most astounding showing, with record breaking outputs. February brought some increase in unfilled orders of the United States Steel Corp. but the gain of 34,854 tons was less than that of 122,000 tons one year before.

The Business Trend

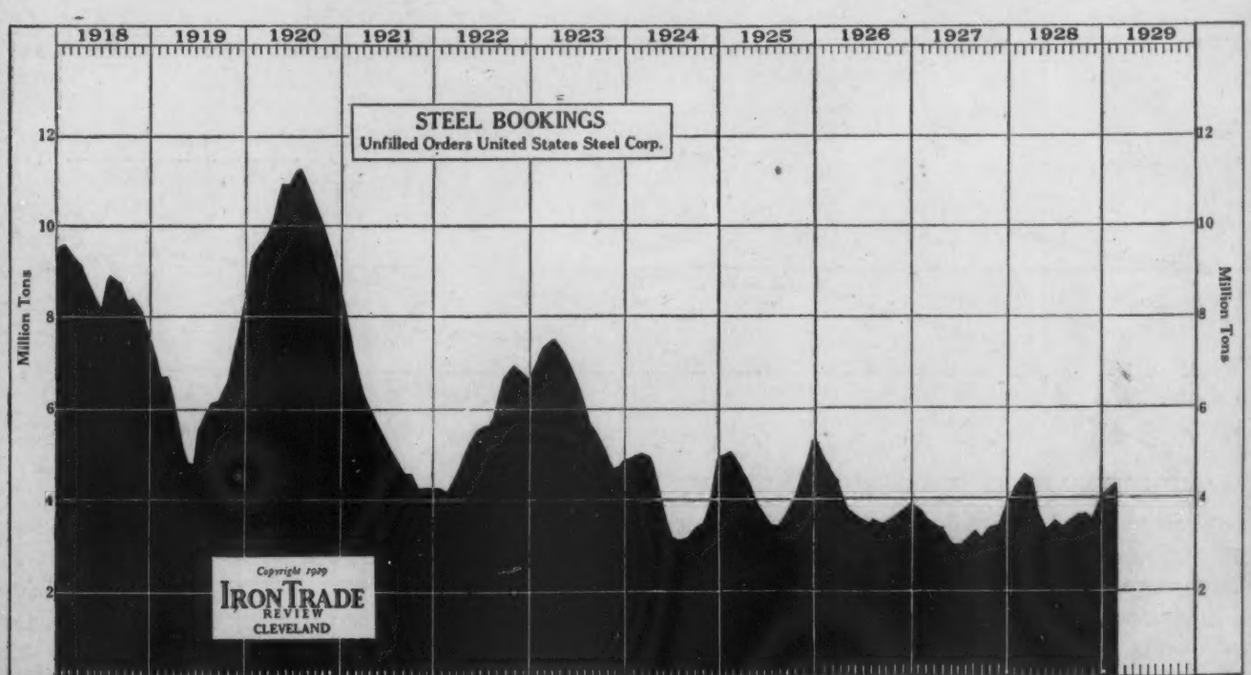


Steel Ingot Output

PRODUCTION of steel ingots in February with a daily average rate of 180,198 tons reached a new high level for all time. The February rate compared with 166,274 tons in January and with an average of 161,812 tons in February, 1928. The output in the month was at the annual rate of more than 55,000,000 tons. The latter tonnage compares with an actual production of open hearth and bessemer steel ingots in 1928 of 49,857,223 tons. Operations during the month were at 95.55 per cent of capacity.

Steel Bookings

UNFILLED orders of the United States Steel Corp. in February increased 34,854 tons. This gain was somewhat smaller than had been generally expected, although it must be viewed in the light of an unprecedented output of steel during the month. At the close of the month, bookings of the corporation stood at 4,144,341 tons. This compared with 4,109,487 tons one month before and with 4,898,189 tons one year ago. During February, 1928, there was an increase of 122,242 tons in unfilled bookings.



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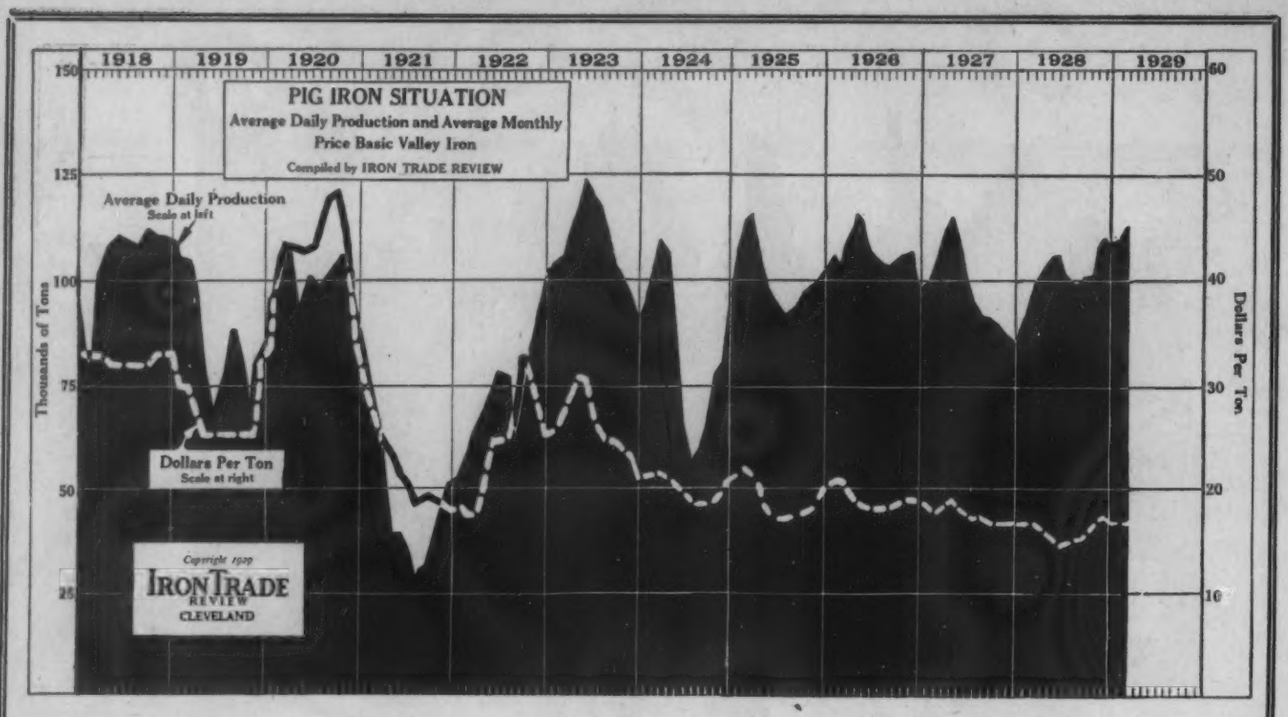
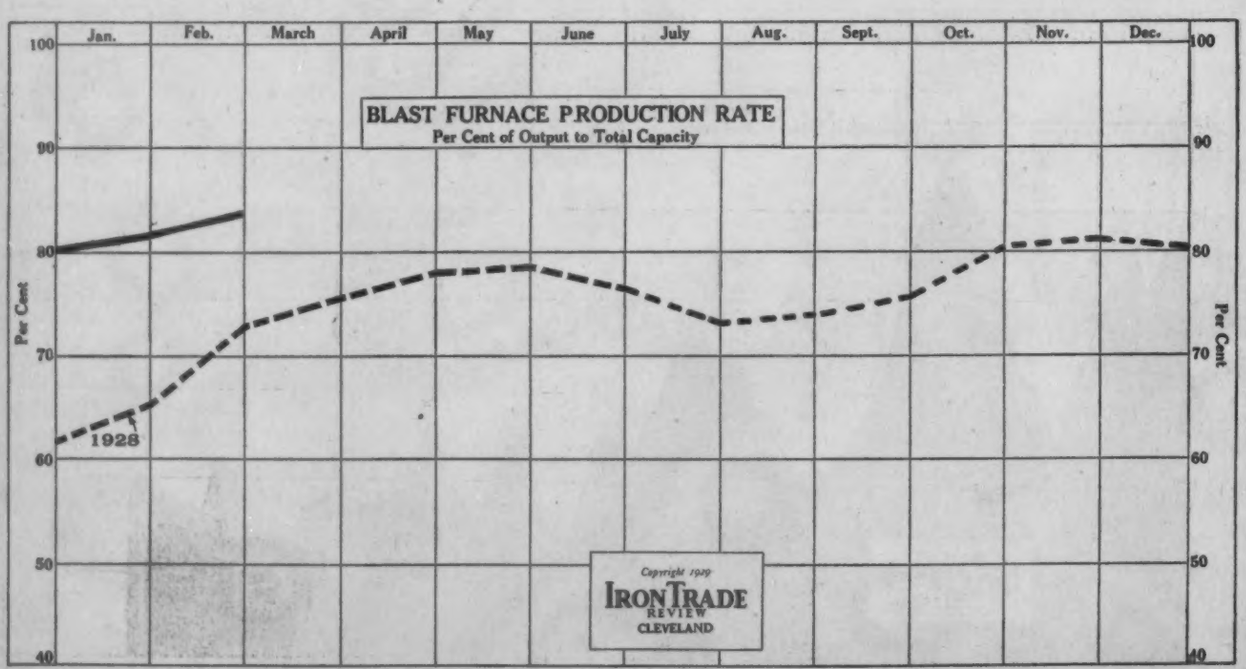


Pig Iron Output

PRODUCTION of pig iron in February stood at a daily average of 114,942 tons, compared with 110,742 tons in January and 99,954 tons in February, 1928. The month's record was a new high for any February and it was only a little short of the high record for all time of 115,207 tons in March, 1925. Average rate of output of pig iron in January and February was 112,684 compared with a daily average rate for all of 1928 of 103,365 tons. February's total of pig iron production was 3,215,332 tons.

Blast Furnace Production Rate

THE rate of operation of blast furnaces in February stood at 84.5 per cent, compared with 81.5 per cent in January and with 73.6 per cent in February, 1928. During the month there was an increase of six in the number of active furnaces, the total at the end of February standing at 208 compared with 202 at the end of January. This increase in the number of furnaces producing iron at the beginning of March indicates further gains in output of pig iron during the current month.



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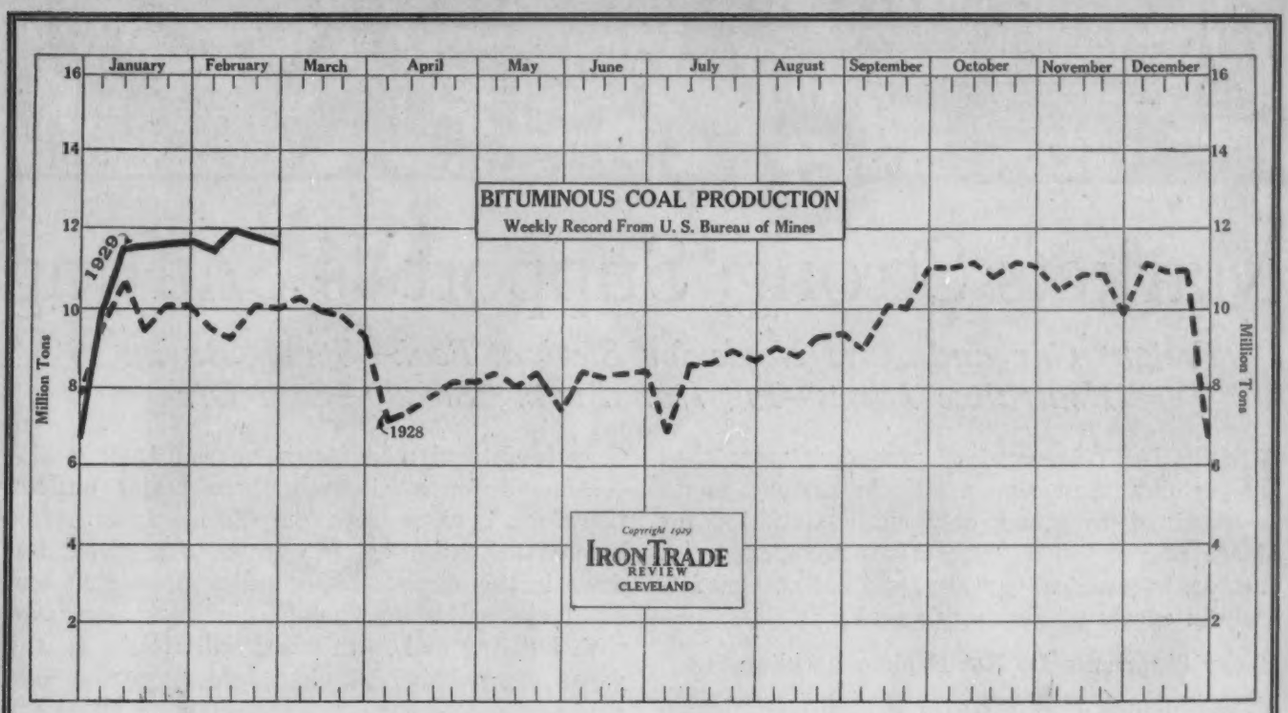
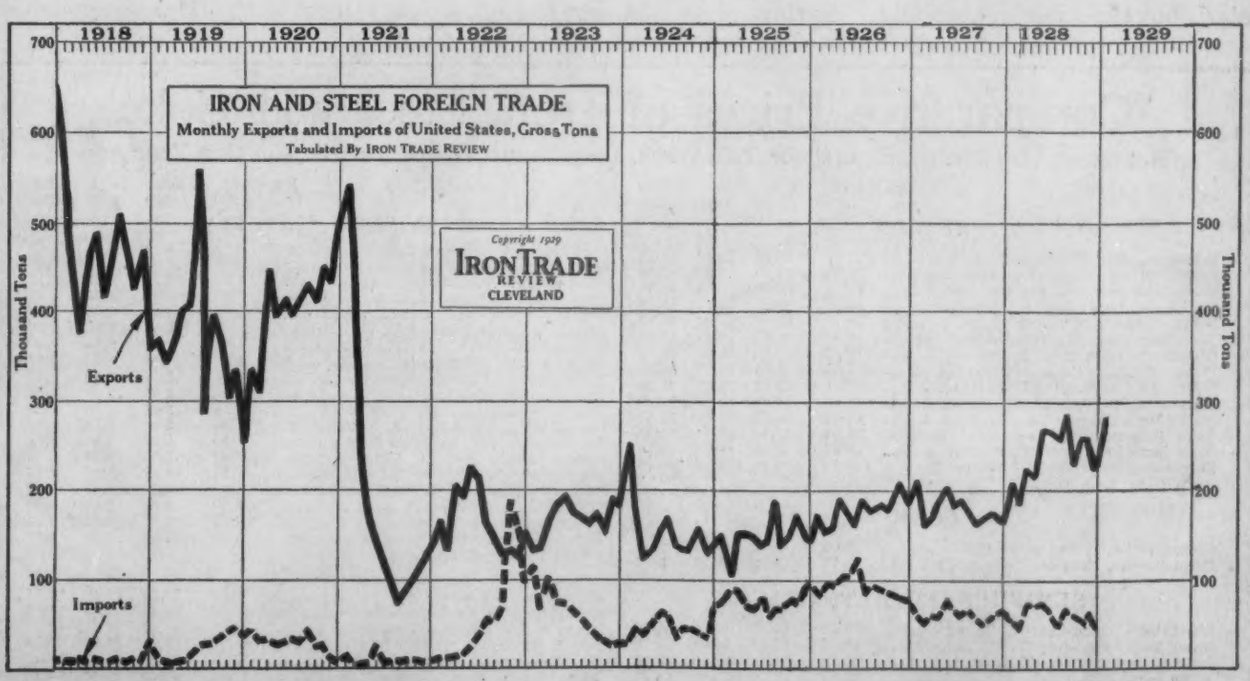


Coal Production

PRODUCTION of soft coal has made an impressive exhibit since the beginning of the current year. February output of 47,400,000 net tons was at an average of 1,975,000 tons daily. This compares with 51,456,000 tons in January, with a daily average of 1,949,000 tons. February, 1928, production was 41,351,000 tons and a daily average of 1,661,000 tons. Coal production has expanded on an important scale in recent months due to the greatly increased industrial activity throughout the country.

Steel Foreign Trade

WITH the beginning of 1929 there came an important increase in the volume of exports of iron and steel products. The total for the month was 274,296 tons, compared with 221,810 tons in December and 205,766 tons in January, 1928. The month's total was the highest, with the single exception of August, 1928, of any month since February, 1921. The gain, chiefly was for scrap, tinplate, casing, pipe and bars. Imports showed a decline standing at 54,793 tons, compared with 55,199 tons in December.



Markets Strong; Support Is Shifting

Freight Car and Auto Needs for Steel at Peak—Spring Buying to Neutralize Losses—Pig Iron Buying Steady—Seek Ore

FEBRUARY'S record of producing more steel per day than any month in history seems destined to stand only until statistics for March are compiled. Operations have expanded further, to practical capacity, and are now moderately in excess of February's peak.

Heavy Shipments Do Not Deplete Backlogs

Continuance of this record gait through March and probably well into April is believed assured. Specifications for finished steel as a whole the past week were the heaviest of the year, for one reason because some producers are standing on March 15 as the deadline for ordering-out first quarter material. Backlogs have not shortened despite exceptional shipments.

But the color of the present market is turning and its support is beginning to shift. Freight car buying has about run its course, although specifications for steel for equipment placed in the past sixty days will be heavy into midsummer. Automobile production, while at a record level, is more spotty and may be passing its peak, unless retail buying spurts suddenly. Spring runs of farm implement manufacturers near their end.

Demand for steel from these major outlets, therefore, is at or is passing its maximum. But before the mills begin to experience a real letdown in this direction it seems probable that seasonal spring buying, notably in lines associated with building and farm work, will rise to fill the gaps. Prospective building, bridge, subway and similar projects have rarely been more attractive at this season, and already makers of wire products detect a stir in farm country buying.

To Hold Production at Top the Problem

Majority opinion within the steel industry is that production is about at its zenith, is likely to remain close to there 30 to 45 days, and chief support will be found in new directions. It may be unfortunate for producers that operations have expanded so rapidly, for their advanced prices will enter the real test period when the edge may be slightly off the market.

Pig iron continues in a strong, steady market, noteworthy this week for an advance of 50 cents per ton on foundry iron in the Mahoning valley.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	March 13, 1929	Feb., 1929	Dec., 1928	March 1928
PIG IRON				
Bessemer, del. Pittsburgh	$20.01	19.86	20.01	19.21
Basic, valley	17.50	17.50	17.50	17.00
Basic, eastern del., eastern Pa.	20.15	20.50	19.75	19.50
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.76	19.01
No. 2 foundry, Chicago	20.00	20.00	20.00	18.50
*Southern No. 2, Birmingham	16.50	16.50	16.50	16.00
*Southern Ohio, No. 2 Ironton	18.50	18.50	18.50	19.00
**No. 2X, Virginia furnace	21.25	21.25	20.50	20.50
**No. 2X, eastern del. Phila.	22.01	22.01	22.01	21.26
Malleable, valley	18.00	18.00	18.00	17.25
Malleable, Chicago	20.00	20.00	20.00	18.50
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	19.26	18.76	18.76	18.51
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	3.00	2.90	2.75	2.60
Connellsville, foundry, ovens	3.75	3.75	3.75	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	35.00	34.25	34.00	33.75
Sheet bars, open-hearth, Pittsburgh	35.00	34.25	34.00	33.70
Billets, open-hearth, Pittsburgh	34.00	33.25	33.00	33.00
Wire rods, Pittsburgh	42.00	42.00	42.00	44.00

	March 13, 1929	Feb., 1929	Dec., 1928	March 1928
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.90	1.90	1.90	1.90
Steel bars, Chicago	2.05	2.00	2.00	2.00
Steel bars, Philadelphia	2.27	2.27	2.27	2.17
Iron bars, Chicago	2.00	2.05	2.00	2.00
Shapes, Pittsburgh	1.90	1.90	1.90	1.90
Shapes, Philadelphia	2.01	2.01	2.06	2.08
Shapes, Chicago	2.05	2.00	2.00	2.00
Tank plates, Pittsburgh	1.90	1.90	1.90	1.90
Tank plates, Philadelphia	2.15	2.10	2.10	2.10
Tank plates, Chicago	2.05	2.00	2.00	2.00
Sheets, black, No. 24, Pittsburgh	2.85	2.85	2.85	2.85
Sheets, blue anl., No. 10, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, gal., No. 24, Pittsburgh	3.60	3.60	3.60	3.75
Sheets, black, No. 24, Chicago	3.10	3.00	3.00	3.05
Sheets, blue anl., No. 10, Chicago	2.35	2.25	2.25	2.25
Sheets, galvanized, No. 24, Chicago	3.85	3.75	3.75	3.90
*Plain wire, Pittsburgh	2.50	2.50	2.45	2.50
*Wire nails, Pittsburgh	2.65	2.65	2.60	2.65
Tin plate, per base box, Pittsburgh	5.35	5.35	5.35	5.25
*To large jobbers				
SCRAP				
Heavy melting steel, Pittsburgh	18.50	18.60	17.60	14.75
Heavy melting steel, eastern Pa.	16.50	16.30	15.35	13.75
Heavy melting steel, Chicago	15.50	16.00	14.50	12.75
No. 1 wrought, eastern Pa.	16.25	16.25	15.50	15.25
No. 1 wrought, Chicago	15.75	15.75	14.50	12.45
Rails for rolling, Chicago	17.50	17.50	16.50	14.45

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh, base	1.90c to 1.95c
Philadelphia, del.	2.10c to 2.25c
New York, del.	2.175c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.09c to 2.14c
Lackawanna, N. Y., base	2.00c to 2.10c
Birmingham, base	2.10c to 2.20c
Coatesville, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.20c to 2.25c
St. Louis, del.	2.22c

STRUCTURAL SHAPES

Pittsburgh, base	1.90c to 1.95c
Philadelphia, del.	2.01c to 2.06c
New York, del.	2.145c to 2.195c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.09c to 2.14c
Lackawanna, N. Y.	2.00c to 2.10c
Birmingham, base	2.10c to 2.20c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh, base	1.90c to 1.95c
Chicago, base	2.05c to 2.15c
Birmingham, base	2.10c to 2.20c
Lackawanna, N. Y., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.90c to 1.95c
Cleveland, del., outside mills	1.95c to 2.00c
Philadelphia, del.	2.22c to 2.37c
New York, delivered	2.24c to 2.39c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	2.00c to 2.10c
New York, delivered	2.19c to 2.24c
Philadelphia, delivered	2.17c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.35c to 2.60c
Chicago, rail steel	2.05c
Chicago, rail steel, road and bridge work	1.95c to 2.05c
Philadelphia, cut lengths	2.75c

COLD FINISHED STEEL

Cold finished steel bars drawn or rolled, Pitts., Chi., c.l.	2.30c
Do, del. Detroit	2.575c
Shafting (turned, polished) Pittsburgh	2.30c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.65c to 3.10c
Cold finished steel bars, Cleve.	2.25c to 2.35c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.35
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh, base	2.85c to 2.95c
No. 24, Philadelphia, delivered	3.17c to 3.27c
No. 24, Gary, Indiana Harbor	3.05c
No. 24, Chicago, delivered	3.10c
No. 24, Birmingham, base	3.10c
No. 24, St. Louis, del.	3.27c

TIN MILL BLACK

No. 28, Pittsburgh, base	3.00c
No. 28, Gary, base	3.10c

GALVANIZED

No. 24, Pittsburgh, base	3.60c to 3.70c
No. 24, Philadelphia, delivered	3.92c to 4.02c
No. 24, Gary, Indiana Harbor	3.80c
No. 24, Chicago, delivered	3.85c
No. 24, Birmingham, base	3.85c
No. 24, St. Louis del.	3.92c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.10c to 2.20c
No. 10, Philadelphia, delivered	2.42c to 2.52c
No. 10, Gary, Indiana Harbor	2.30c
No. 10, Chicago, delivered	2.35c
No. 10, Birmingham, base	2.35c
No. 10, St. Louis, del.	2.42c

AUTOMOBILE

No. 20, Pittsburgh, base	4.10c
No. 20, delivered Detroit	4.39c

FURNITURE

No. 24, Grade A, Pittsburgh	4.00c to 4.10c
No. 24, Grade B, Pittsburgh	3.80c to 3.90c

(Turn to the following page)

Some important and close buyers, including the Standard Sanitary Mfg. Co. and General Electric Co., are closing on their second quarter requirements. Heavy sales are reported at Cleveland, St. Louis and New York. Shipments are a record.

Other raw materials reveal a conflicting trend. Beehive and by-product coke prices are somewhat stronger, though approaching the time when shrinking domestic needs will release capacity for metallurgical grades. Iron and steel scrap prices are influenced more by supply than demand, and in anticipation of a spring letdown in steelmaking 60 days hence, dealers look for a gradual drop.

In bars, sheets, strip and plates deliveries continue the paramount consideration, and on the much-wanted classifications are more deferred. On the higher sheet finishes some mills are scheduled into June. Due largely to demand from carbuilders, eight-week delivery is promised on plates at Chicago. More barge work is up at Pittsburgh. Premiums are offered for hot strip at Chicago.

Low French Pipe Bid Is Rejected

Cast iron pipe begins to reflect the spring revival in municipal work, with bookings and production up slightly. Though French sellers undercut the market $5 per ton at Bloomington, Ill., that city placed 6000 tons with domestic makers. Freight car inquiry, among which the New York Central and Erie lists are dominant, has been swelled by 1200 for the Northern Pacific and 250 for the Nickel Plate. The week's orders comprise chiefly miscellaneous equipment and 500 underframes. The Pennsylvania is buying 4000 tons of tie plates and 16,500 kegs of spikes.

Chicago and Pittsburgh district steelmaking rates hold at the level of late last week, at 95 and 90 per cent, respectively. Sheet, strip and bar mills in both districts are at practical capacity. Buffalo has reached a new peak, with 33 out of 37 open-hearth furnaces melting. Mahoning valley independents still have 49 out of 51 open hearths on, with the shortage of semifinished steel still acute. Steel corporation subsidiaries made a gain of 2 points this week, to 97 per cent, probably the highest rate in their history. Independents are at 92 per cent and the entire industry at 94.

Will Set 1929 Lake Ore Price Soon

Inquiry for 1929 Lake Superior ore, opened last week by the Ford Motor Co., is broadening and now totals about 1,000,000 tons. Shippers believe the 1929 movement will exceed the 1928 one and hope the strong price situation in pig iron and finished steel will be reflected in ore.

February's daily rate of 180,198 gross tons of steel ingots compares with a 166,274-ton rate in January, 161,812 tons last February, and the previous record of 172,144 tons last October.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets Tin Plate, Wire Nails and Black Pipe

This week (March 13, 1929)	$36.37
Last week (March 6, 1929)	36.37
One month ago (February, 1929)	36.28
Three months ago (December, 1928)	36.22
One year ago (March, 1928)	35.81
Ten years ago (March, 1919)	52.28
Fifteen years ago (March, 1914)	23.60

For the third consecutive week the IRON TRADE REVIEW composite of fourteen leading iron and steel products is unchanged at $36.37. A month ago this index stood at $36.28 and a year ago it was at $35.81.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts	2.00c
Hot strip 6⅛ to 24-in., Pitts.	1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c plate basis, or 2.10c blue annealed basis.	
Hot strip, bands 6 in. and under, Chicago	2.20c to 2.30c
Do, 6⅛ to 24 in.	2.10c to 2.20c
Cooperage stock	2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 ton and over)	2.75c to 2.85c
Worcester, Mass. (3 tons and over)	3.10c to 3.20c

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.60c to 2.65c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium	1.50	4.25
Carbon Vanadium	0.95	3.70
9250 (flats)	0.25	3.00
9250 (rounds squares)	0.50	3.25

TUBING

Boiler

Carload Discounts—F.o.b. Pittsburgh Mills

Steel (lapweld) 3¼ to 3¾-inch	56
Charcoal iron, 3¼ to 3½-inch	18
Seamless hot rolled 3¼ to 3½-inch	56

Lapwelded steel takes two supplementary 5 per cents for carload lots; charcoal, 10 per cent; seamless, 5 per cent.

Note: Discounts for additional sizes and l.c.l. shipments given on last editorial page.

COLD DRAWN SEAMLESS

F.o.b. mill in desirable quantities

Random lengths, over 5 feet	55 per cent
Selected lengths, 1 to 18 feet	53 per cent

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base

(Per pound)	Dealer trade	Large jobbers
Bright plain wire, 6 to 9 gage	2.60c	2.50c
Annealed field wire	2.75c	2.65c
Galvanized wire	3.20c	3.10c
Barbed wire, galvanized	3.40c	3.30c
(Per 100-pound keg)		
Wire nails	$2.75	$2.65
Galvanized nails	4.75	4.65
Polished staples	3.20	3.10
Galvanized staples	3.45	3.35
Cement coated nails	2.75	2.65
Manuf. wire, del. Detroit		2.735c
Wire nails, del. Detroit		$2.885

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher; Worcester, Mass., Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, Duluth, Birmingham $3 higher.

CUT NAILS, CHAIN PILING

Cut nails c.l., f.o.b. mills	2.75c
Cut nails, l.c.l. f.o.b. mills	2.85c
Chain, 1-in., proof coil, Pitts	6.00c
Sheet piling, base, Pittsburgh	2.25c

CAST IRON WATER PIPE

Prices per net ton
Class B pipe

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Four-inch, New York	42.80 to 44.80
Six-inch and over, New York	39.80 to 41.80
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20 gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 and 1¼-inch butt iron**	31	15

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del. 2½ points less.

*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent.

**Large jobbers obtain additional discount of 1 point with supplementary discounts of 5 and 2½ per cent on black and galvanized. For add. sizes see last editorial page.

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relaying rails, St. Louis	$24.00 to 31.00
Relay rails, Pitts.. 60 to 90 lb.	$22.00 to 27.00
Light rails, 25 to 45, mill	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand, jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts	$43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.	
Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc. c.l., Pitts-Cleve.	2.90c to 3.10c
Structural, c.l. Chicago	3.00c to 3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Lock: to dealers	85-5 off
Lock: to consumers	85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$34.00
Pittsburgh, bessemer	34.00
Youngstown	34.00
Cleveland	34.00
Philadelphia	38.30 to 39.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	38.00 to 39.00
Forging, Philadelphia	43.30 to 44.30

SHEET BARS

Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00
Chicago	35.00

SLABS

Pitts., Young., and Cleve.	$34.00

WIRE RODS

Pittsburgh, Cleveland	$42.00
Chicago	43.00

SKELP

All grades, Pittsburgh	1.90c to 1.95c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.55
Mesabi bessemer, 51½%	4.40
Old range nonbessemer, 51½%	4.25
Mesabi nonbessemer, 51½%	4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%	8.00
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN ORE
Cents per unit, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	10.50 to 11.00
North African low phosphorus	11.50 to 11.75
Swedish foundry or basic, 65%	9.00 to 10.00
Spanish and North African basic, 50 to 60 per cent	10.00 to 11.00
Newfoundland foundry, 55%	8.50 to 9.00
Tungsten spot and early fut., short ton unit, duty paid	$11.75 to 12.00

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	35 cents
Indian	35 to 36 cents
Caucasian, (53-55 per cent)	36 to 38 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, imported duty paid east. tide., gross ton	$19.90 to 20.40

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Pig Iron

Consumers Covering for Larger Tonnages as Second Quarter Approaches—Valley Prices Advanced by Several Makers

SOME acceleration is noted in pig iron buying as the second quarter approaches, but the principal satisfaction furnace interests have been deriving has been the strong, steady demand, week after week. Current shipments are ahead of the February average; sales for second quarter have been larger than for the first three months, and it is generally estimated about 75 per cent of the second quarter requirements are covered. The most important development in the week is the advance of 50 cents announced by several valley furnaces, bringing foundry iron to $18, base. Two smaller valley interests continue to offer at $17.50. Competition is less keen in other districts, and the market is stronger. Valley makers now are holding for $17.50 for basic.

PITTSBURGH, March 12.—The pig iron market is stronger, with producers taking a definite stand for higher prices. Leading interests have advanced their quotations 25 to 50 cents on various grades, and some business has been placed at the new levels. The Standard Sanitary Mfg. Co. has closed for its second quarter requirements of foundry iron for its Pittsburgh and New Brighton, Pa., plants. This tonnage was placed at $17.50, valley, for No. 2 plain and $18 for No. 2X. Producers have withdrawn these quotations and now are holding to $18, base, at which level a few orders of several hundred tons each have been placed. Furnaces are in a strong position to support a price advance. Several are booked to June 1, and all are well supplied with good backlogs through April. Production is well maintained, and shipments exceed output. Considerable second quarter business has been booked, but a number of consumers remain to be covered for that period.

The upward revision of valley prices brings basic and No. 2 foundry iron to $18, and malleable and bessemer to $18.50.

Boston, March 12.—Pig iron prices are steady. Buffalo iron appears firm at $18.50, base, furnace, for delivery in this district. Sales in the past week totaled 3000 tons, of which the Mystic Iron Works booked about 2000 tons. General Electric Co. placed 2000 tons for New England plants.

New York, March 12.—Pig iron demand has broadened. During the past week sales aggregated about 15,000 tons, mainly for second quarter. General Electric Co., closed for 4000 to 5000 tons for various plants. Inquiries now pending call for about 5000 tons for second quarter. Some Buffalo producers are quoting $18, base, Buffalo, as a minimum on foundry iron, but Buffalo foundry iron still can be had at $17 to $17.50, base, furnace; while in some instances lower equivalent delivered prices have applied. The market at consuming points in this territory continues $20.28 to $22.41 delivered for the base grade, depending on freight rates.

Buffalo, March 12.—A good share of the General Electric Co.'s 5000-ton purchase of pig iron came to Buffalo furnaces. Numerous other orders for 200 to 1000 tons have been booked. Several large sellers say their second quarter bookings are close to their capacity. Steelworks are becoming a negligible factor in the market. Prices have gained considerable firmness over the week end.

Cincinnati, March 12.—Continued activity in second quarter business has brought the pig iron market here into a strong position. Inquiry is brisk. The outstanding inquiries are from Indiana buyers. Other miscellaneous inquiries total 2500 tons. One dealer reports that a little business had been closed for third quarter. Activity in southern iron is light. Prices are steady.

Cleveland, March 12.—Pig iron demand continues strong, daily average of shipments thus far in March exceeding February, and new orders flowing in at a substantial, steady rate. Furnace interests here booked 40,600 tons the past week, against 45,200 tons the week preceding. The weekly volume has been close to these figures for a month. Concensus of opinion among furnace interests is that 75 per cent of second quarter requirements of melters has been covered. Several inquiries for round tonnages noted last week have been closed. New inquiries generally call for larger tonnages than recently, small-lot buying for filling in purposes diminishing as the heavier requirements for second quarter are given attention. While several valley producers now are on a basis of $18 for foundry iron two others continue to offer iron at $17.50. The Cleveland situation is not much affected by the stronger tone in the valley, as there is not much activity in the market here at present, and foundry iron at $18, valley, is equivalent to $19.76, delivered, Cleveland, compared with the current local delivered price of $19.60. No change is expected in the Cleveland base price of $19 until the valley market is at $18.25 or $18.50. Other lake furnace prices are unchanged, though less competition now is expected from valley furnaces in the western Ohio and Indiana districts. The price in Michigan may be advanced 50 cents.

The Hanna Furnace Co. has been relining one of its two stacks at Detroit, and it probably will be relighted the latter part of March.

Chicago, March 12.—The heavy buying of pig iron for second quarter noted in recent weeks is being followed by important quiet inquiries for supplemental first quarter needs. All grades are available for shipment, despite the heavy drain on furnace stocks by the steady shipments of the past several months. Larger demand for castings is being reported generally in the Chicago-Milwaukee district. Spot and future orders are being booked at $20, Chi-

(*Concluded on Page* 736)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$18.25 to 18.50
Bessemer, del. Pittsburgh	20.01 to 20.26
Basic, valley furnace	17.50 to 18.00
Basic, del. Pittsburgh	19.26 to 19.76
Basic, Buffalo furnace	17.50
Basic, del. eastern Pa.	20.15 to 20.76
Malleable, valley furnace	18.00 to 18.50
Malleable, del. Pittsburgh	18.76 to 19.26
Malleable, Cleve. furn. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	19.00
Malleable, del. eastern Pa.	21.76 to 22.26
Malleable, Granite City fur.	20.50
No. 1 foundry, Chicago furnace	20.50
No. 1X, eastern del., Phila.	22.26 to 22.76
No. 1X, Buffalo furnace	20.00
No. 2 foundry, valley furnace	17.50 to 18.00
No. 2 foundry, del. Pittsburgh	19.26 to 19.76
No. 2 plain, Buffalo furnace	18.50
No. 2 foundry, Chicago furnace	20.00
No. 2 foundry, Granite City	20.00
No. 2 foundry, Ironton furnace	18.50
No. 2 fdy. Cleve. furn. for local del.	19.00
No. 2 plain, del., Phila.	21.26 to 21.76
No. 2 plain, Virginia furnace	20.75
No. 2 plain, Buffalo, del. Boston	22.41 to 22.91
No. 2 plain, N. J., tidewater	20.28 to 21.28
No. 2 Alabama, Birmingham	16.50
No. 2 Alabama, del. Cincinnati	20.19 to 20.69
No. 2 Tenn., Birmingham base	16.50
No. 2 Tenn., del. Cincinnati	20.19
No. 2 Alabama, del. Chicago	22.51 to 23.01
No. 2 Alabama, del. Cleveland	22.76 to 23.26
No. 2 Alabama, del. St. Louis	21.42
No. 2X, east, N. J., tidewater	20.78 to 21.78
No. 2X, eastern, del. Phila.	21.76 to 22.26
No. 2X, foundry, Buffalo furnace	19.00
No. 2X, Buffalo, del. Boston	22.91 to 23.41
No. 2X, Virginia furnace	21.25
Gray forge, val., del. Pittsburgh	19.26
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.26 to 24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00 to 25.50
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00 to 25.50
Basic, del. Montreal	24.00 to 24.50

Silvery iron, Jackson county, O., furnaces, in per cents: 5—$23 to $24; 7—$25 to $26; 8—$26 to $27; 9—$27 to $28; 10—$29 to $30; 11 $31 to $32; 12—$33 to $34; 13—$35 to $36.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$31 to $32, 11—$33 to $34; 12—$35 to $36; 13—$37 to $38; 15—$41.50 to $42.50; 16—$43 to $44.

The Market Section

Coke

Foundry in Heavier Demand, and Prices Stronger—Easier Tone in Beehive Furnace Fuel

FOUNDRIES continue to absorb an unusually heavy tonnage of coke, especially those in the Michigan manufacturing area. Beehive foundry coke is stronger, producers being able to obtain $4 more frequently for second quarter. Scarcity of surplus furnace coke in the Connellsville district is helping to support the price, but the market is easier at $3. Less demand is felt for heating coke.

Pittsburgh, March 12.—Beehive furnace coke retains most of its recent strength, due mainly to a scarcity of surplus fuel rather than to active spot demand. The majority of leading producers continue out of the spot market, with shipments on contracts absorbing practically all of their current output. On spot business that appears $3 is the general price. Several second quarter contracts have been signed with prices varying from $3 to $3.15. Foundry coke is stronger, with $4 applied more frequently on second quarter contracts than the former $3.75 minimum. Premium grades continue quotable at $4.85, Heating coke is in less demand, with moderation in the weather, and prices have weakened.

Production of coke in the Connellsville region for the week ended March 2 was 78,230 tons, compared with 67,940 tons the preceding week, according to the *Connellsville Courier*.

Boston, March 12.—Demand for coke continues heavy throughout the New England district. Ovens are working at capacity. Prices are firm.

New York, March 12.—Foundry coke specifications continue brisk. By-product foundry coke continues $11, delivered, New England, and $9 to $9.40 delivered at Newark, N. J. High-grade beehive foundry coke continues $4.85, Latrobe, Pa., while Connellsville foundry coke ranges from $3.75 to $4, Connellsville. Beehive furnace coke continues $3 to $3.25, Connellsville, with the tone somewhat easier.

Detroit, March 12.—Despite capacity operations at all by-product coke oven plants in this district, demand has been exceeding supply. Recent cold weather has increased requirements for domestic grades. Foundries are running on short rations and coke has been brought in as far as from the Connellsville district. By-product foundry coke is 50 cents higher, at $9, ovens, or $9.50, delivered, Detroit.

Cincinnati, March 12.—The movement of by-product foundry coke continues brisk. Buyers are specifying heavily. Sellers are finding no difficulty in placing the output of by-product foundry coke. Although some beehive coke is reported to be going to the Detroit district, a few cancellations are reported.

St. Louis, March 12.—Coke tonnage is being ordered out in heavy volume, mills and foundries increasing consumption. Shipments to points outside the district since Jan. 1 have been the largest since the war. Prices are steady.

Birmingham, Ala., March 12.—Foundries and other consumers of coke are showing a tendency to increase their orders. Shipments in small tonnages to the middle West still are underway. Prices are steady.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.00 to 6.50
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.75
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	10.03
Ashland, Ky.	8.00
Portsmouth, O.	8.00
Detroit ovens	9.00
Buffalo, ovens	8.75

Ferroalloys

Specifications Heavy—Market Firm—A Few Spot Orders Received

Pittsburgh, March 12.—Ferroalloy specifications continue heavy with occasional spot orders for ferromanganese and spiegeleisen. Current prices are $109.79, delivered Pittsburgh, for ferromanganese and $34 for spiegeleisen. Such tonnage is confined to small consumers who ordinarily purchase only a few carloads a year and are not under contract. Those who contract regularly have not been forced to supplant their specifications with spot orders. Demand for other ferroalloys is well maintained, with no changes noted in prices. Fluorspar continues firm at $18.

New York, March 12.—Shipments of ferroalloys are extremely large, but prices are unchanged. The gradual development of various corrosion resisting iron and steel products is of special importance to ferrochrome. Tungsten is strong, with wolframite $11.65 to $12, a short ton unit, duty paid. Ore for early arrival is especially strong.

Refractories

Strong Demand for Repair and Construction Programs

REFRACTORIES PRICES, PAGE 732

Pittsburgh, March 12.—Demand for refractory material is brisk. Brick for repair work predominates, but a number of new projects are under way and business shows an improvement compared with a year ago. Repair work reflects in a large measure activity in the steel and other industries last year. New construction, particularly in the Pittsburgh district, is more active than last year. Work pending and actually under way is larger than the total for all of 1928. This includes the Davison Coke & Iron project on Neville Island, the new plant of the A. M. Byers Co., Ambridge, Pa., for manufacture of wrought iron by the Aston process, and the new Brunot Island power plant of the Duquesne Light Co. Refractory makers continue pressed in making delivery, and little tendency is shown on the part of users to increase stocks. Prices are well maintained at $43 to $46 on first quality fire clay and $43 on silica brick. Second quality clay brick is $35 to $38.

Buffalo Hits High Mark

Buffalo, March 12.—Steelworks production reached its peak of the year this week, with 33 of 37 open hearths melting. March operations will continue as near capacity as operating conditions will permit.

Completes New Bar Mill

A new 12-inch cross-country mill for rolling bars and piling will be scheduled next month at the Massillon, O., division of the Central Alloy Steel Corp. The company's hot strip mill will close down shortly to permit repairs to be made.

Ferroalloy Prices

(In dollars, except ferrochrome)

Ferromanganese, 78 to 82 per cent tidewater duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.04 to 1.10
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producer's plant, net ton	160.00
Do, one ton to carload	170.00
Ferrophorphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Quantity diff. apply on 100 tons and over.
*These prices contract, spot $5 higher.

Scrap

Quiet Situation General with Prices Little Changed — Melt Heavy but Buying Moderate

ACTIVITY by consumers has given way to a quiet situation, with dealers taking scrap to apply on tonnage orders closed a fortnight ago. Prices are relatively steady, with some recession. Some grades are scarce and relatively higher. Sales to melters are mostly small lots. Weather handicaps are receding.

Chicago, March 12.—Considering the vigorous rate of steelworks consumption, the price of heavy melting steel appears sentimentally weak. The last consumer sale of heavy melting steel was at $16, although dealers are buying railroad melting steel up to $16.50, gross, on tracks. Most scrap grades are holding their own, with exceptions of weaknesses in such grades as cast borings and hydraulic compressed sheets. Consumers of borings have been out of the market for some time, and dealers have revised their asking prices to a range of $11 to $11.50. Electric furnace and steel foundry grades are active and remain at a high level. Dealers and yards have a heavy volume of unfilled orders, and short selling has broadened.

New York, March 12.—For the first time in two or three weeks local scrap dealers' buying prices are unchanged. There has been little consuming demand of importance, but the market generally is firm, with high mill operation exerting a strengthening influence.

Boston, March 12.—While there has been only slight improvement in iron and steel scrap the past week, a few

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	12.00 to 12.50
Boston, dealers	12.00 to 12.25
Boston, No. 2	10.00 to 10.50
Buffalo, No. 1	16.50 to 17.50
Buffalo, No. 2	14.25 to 14.75
Chicago	14.00 to 14.50
Cincinnati, deal.	13.75 to 14.25
Cleveland, No. 1..	15.75 to 16.00
Cleveland, No. 2..	15.25 to 15.75
Detroit, No. 1	14.00 to 14.25
Detroit, No. 2	12.00 to 12.25
East Pa., del. mill	16.50
Eastern Pa. No. 2	12.00 to 14.50
N. Y., deal., R. R.	12.50 to 13.00
N. Y., deal., yd.	8.50 to 9.50
Pittsburgh, No. 1..	18.00 to 18.50
Pittsburgh, No. 2..	16.50 to 17.00
St. Louis, No. 1....	14.00 to 14.50
St. Louis, No. 2....	13.00 to 13.50
Valleys, No. 1.....	18.00 to 18.50

COMPRESSED SHEETS

Buffalo	15.00 to 16.00
Chicago	14.00 to 14.50
Cleveland	15.00 to 15.50
Detroit	14.00 to 14.25
E. Pa. new mat.	14.50
Pittsburgh	18.25 to 18.50
Valleys	18.00 to 18.25

BUNDLED SHEETS

Buffalo	12.50 to 13.00
Cincinnati, deal.	11.00 to 11.50
Cleveland	13.00 to 13.50
Eastern Pa.	11.00 to 11.50
Pittsburgh	16.50 to 17.00
St. Louis	10.00 to 10.50

SHEET CLIPPINGS LOOSE

Chicago	8.50 to 9.00
Cincinnati	10.00 to 10.50
Detroit	9.00 to 9.50
St. Louis	10.00 to 10.50

STEEL RAILS, SHORT

Birmingham	13.00 to 14.00
Boston	11.25 to 12.25
Buffalo	19.00 to 20.00
Chicago, (3 feet)	18.50 to 19.00
Chicago, 2 ft. and under	19.50 to 20.00
Cincinnati, deal.	19.00 to 19.50
Detroit	17.00 to 17.50
Pittsburgh	20.50 to 21.00
St. Louis	16.75 to 17.25

STOVE PLATE

Birmingham	13.00 to 13.50
Boston consumers..	11.00 to 11.50
Buffalo	14.75 to 15.00
Chicago, net	12.75 to 13.25
Cinn., deal., net	10.00 to 10.50
Detroit, net	9.50 to 10.00
Eastern Pa.	12.50 to 13.00
N. Y. deal., mill	8.75 to 9.00
Pittsburgh	12.50 to 13.00
St. Louis	13.75 to 14.25

ANGLE BARS—STEEL

Chicago	17.00 to 17.50
St. Louis	14.75 to 15.25

COUPLERS, SPRINGS

Buffalo	18.50 to 19.50
Chicago	17.00 to 17.50
Eastern Pa.	19.00 to 19.50
Pittsburgh	21.00 to 21.50
St. Louis	15.75 to 16.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	19.00 to 20.00
Eastern Pa.	19.00 to 20.50
Pitts. billet and bloom crops	22.50 to 23.00
Cleve. billet and bloom crops	17.50 to 18.00

FROGS, SWITCHES, GUARDS

Chicago	16.75 to 17.25
St. Louis	15.25 to 15.75

SHOVELING STEEL

Chicago	15.50 to 16.00
Cleveland	11.75 to 12.00
Detroit	10.75 to 11.00
Pittsburgh	18.25 to 18.75
St. Louis	14.00 to 14.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.50 to 11.50
Boston, dealers	11.00 to 11.25
Yard wrought	9.00 to 9.25
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	16.00 to 17.00
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	15.50 to 16.00
Cinn., No. 2	13.75 to 14.25
Eastern Pa.	16.00 to 16.50
N. Y., No. 1 deal..	12.00 to 12.50
Pittsburgh, No. 1..	14.50 to 15.00
Pittsburgh, No. 2..	18.25 to 18.75
St. Louis, No. 1....	13.25 to 13.75
St. Louis, No. 2....	14.00 to 14.50

SPECIFICATION PIPE

Boston	10.75 to 11.00
Eastern Pa.	15.50 to 16.00
New York, deal.	11.25 to 11.75

BUSHELING

Buffalo, No. 1	15.00 to 16.00
Chicago, No. 1	14.00 to 14.50
Cinn., No. 1 deal.	11.00 to 11.50
Cinn. No. 2	8.00
Cleveland, No. 1..	13.00 to 13.50
Cleveland, No. 2..	11.25 to 11.75
Detroit, No. 1	12.00 to 12.50
St. Louis, No. 1....	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston	6.25 to 6.50
Buffalo	8.25 to 8.75
Chicago	9.50 to 10.00
Cincinnati, deal.	9.25 to 9.50
Cleveland	10.50 to 11.00
Detroit	7.25 to 7.50
Eastern Pa.	11.50
New York, deal.	8.00
Pittsburgh	10.75 to 11.25
St. Louis	8.00 to 8.50
Valleys	11.50 to 12.00

MIXED BORINGS, TURNINGS

For blast furnace use

Boston, dealers	6.00 to 6.25
Buffalo	11.75 to 12.25
Cincinnati, deal.	9.50 to 10.00
Cleveland	11.25 to 11.75
Detroit	9.00 to 9.25
Eastern Pa.	10.00 to 11.00
New York, deal.	6.25 to 6.50
Pittsburgh	11.50 to 12.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 8.50
Boston, chem.	10.00 to 10.50
Boston, dealers	6.50 to 7.00
Buffalo	11.75 to 12.25
Chicago	11.00 to 11.50
Cincinnati, deal.	9.50 to 10.00
Cleveland	11.50 to 12.00
Detroit	9.00 to 9.25
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	7.00 to 7.50
Pittsburgh	11.50 to 12.00
St. Louis	10.00 to 10.50

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	13.50 to 14.00
Chicago, net	12.50 to 13.00
Cincinnati	10.00 to 10.50
Eastern Pa.	12.50 to 13.00
New York, deal.	9.25 to 9.75
St. Louis	13.00 to 13.50

FORGE FLASHINGS

Boston, dealers	10.00 to 10.25
Buffalo	13.75 to 14.25
Chicago	10.50 to 11.00
Cleve., over 10 in.	13.00 to 13.50
Detroit	12.50 to 12.75
Pittsburgh (light)	15.00 to 15.50

FORGE SCRAP

Boston, dealers	9.00 to 9.50
Chicago	18.50 to 19.00
Eastern Pa.	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago, net	21.50 to 22.00
St. Louis	22.00 to 22.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	14.00 to 14.50
Chicago	13.00 to 13.50
Cleveland	12.50 to 13.00
Eastern Pa.	15.00 to 16.00
Pittsburgh	16.50 to 17.00
St. Louis	12.00 to 12.50

STEEL CAR AXLES

Birmingham	18.00 to 19.00
Boston, ship point	16.50 to 17.00
Buffalo	19.00 to 20.00
Chicago	18.00 to 18.50
Eastern Pa.	22.75 to 23.00
Pittsburgh	21.50 to 22.00
St. Louis	20.50 to 21.00

SHAFTING

Boston, ship point	15.00 to 15.50
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 20.00
New York, deal.	15.00 to 15.50
St. Louis	18.50 to 19.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 13.00
Boston, iron	14.00 to 14.50
Buffalo, iron	14.00 to 14.50
Buffalo, steel	18.50 to 19.50
Chicago, iron	14.50 to 15.00
Chi., rolled steel	19.00 to 19.50
Cincinnati	12.50 to 13.00
Eastern Pa. cast	16.50 to 17.00
Eastern Pa., rolled	19.00
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	21.00 to 21.50
St. Louis, iron	15.25 to 15.75
St. Louis, steel	18.00 to 18.50

No. 1 CAST SCRAP

Birmingham, cup.	14.00 to 14.50
Buffalo	16.00 to 17.00
Boston, textile	13.50 to 14.50
Chicago, mach.	17.90 to 18.50
Chicago, railroad	17.90 to 18.50
Chicago, agri.	16.25 to 16.80
Cincinnati, mach. cupolas, gross	19.50 to 20.00
Cleveland, cupola	16.50 to 17.00
Detroit, net	13.00 to 13.50
East. Pa., cupola	16.00 to 17.00
N. Y., cup., deal.	13.00 to 13.50
N. Y., del. local foundries	17.00 to 17.50
Pittsburgh, cupola	15.00 to 15.50
San. Fran., del.	13.50 to 14.00
Seattle	16.00 to 16.25
St. L. No. 1 mach.	16.00 to 16.50
St. Louis, No. 1	15.00 to 15.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	13.00 to 13.50
Cleve., breakable	12.50 to 12.75
Detroit, auto., net	18.00 to 18.50
Detroit, breakable	9.50 to 10.00
Eastern Pa.	15.75 to 16.00
New York, deal	11.75 to 12.50
Pittsburgh	12.75 to 13.25

MALLEABLE

Boston, railroad	16.50 to 17.00
Buffalo	17.50 to 18.50
Chicago, agri.	15.50 to 16.00
Chicago, railroad	18.50 to 19.00
Cinn., R. R., deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	16.00 to 16.50
Detroit, auto	14.00 to 14.50
St. Louis, rail	16.50 to 17.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	14.00 to 15.00
Boston, dealers	12.25 to 12.50
Rails scrap, Boston	11.00 to 12.25
Skeleton, Boston	9.00 to 9.50
Buffalo	16.00 to 16.50
Chicago	17.50 to 18.00
Eastern Pa.	18.00 to 18.50
New York	14.00 to 14.50
Pittsburgh district	18.00 to 18.50
St. Louis	16.00 to 16.50

LOCOMOTIVE TIRES

Chicago, cut	19.00 to 19.50
St. Louis, No. 1	15.50 to 16.00

LOW PHOS. PUNCHINGS

Chicago	17.50 to 18.00
Pittsburgh	20.50 to 21.00

lines developed rather better demand than was the case for the two or three weeks previous. Heavy melting steel, machine shop turnings, cast iron borings for steel mills, skeleton, forge flashings, mixed borings and turnings and forge scrap had the best of the demand.

Buffalo, March 12.—There is brisk demand for all grades of scrap, particularly for low phosphorus, short steel rails and No. 1 cast. Prices show little change from recent quotations. A railroad list brought the equivalent of $17.60, delivered at Buffalo steelworks, for selected material.

Pittsburgh, March 12.—Little activity is noted in iron and steel scrap from the standpoint of mill buying although dealers are covering on recent short sales. Steel specialties and low phosphorus scrap continue strong, with higher prices paid on the former. Specialties on the March scrap list of the Pennsylvania railroad, on which bids closed March 13, are restricted to small tonnage and in the face of good demand from local consumers the market has advanced 50 cents over previous transactions, to $21.50.

Cleveland, March 12.—Little new buying of scrap by consumers is noted. Dealers are not increasing their bids in covering contracts and the market is practically stationary. Scrap production is heavy among automobile and allied plants and offerings for April will be large. Railroad lists are expected to be heavy. Heavy melting steel is quoted at $15.75 to $16 with occasional purchases of high-grade scrap at $1 to $2 a ton premium.

Cincinnati, March 12.—Iron and steel scrap continues quiet. No tonnages have been placed although some buying is reported. Cast iron borings, mixed borings and turnings and machine shop turnings are off 25 cents.

Detroit, March 12.—Though less spectacular, subsidence in iron and steel scrap prices continues and dealers believe the market will slowly work to lower levels. This, dealers maintain, is largely because supply is exceeding demand even with extraordinary requirements from Youngstown, Cleveland and Pittsburgh district consumers. Rejections and holdups are less frequent but numerous enough to disturb. Automobile plants continue to issue special as well as regular lists. Except for a reduction of 25 cents in mixed busheling, prices generally are unchanged but the 25-cent reduction in borings in a few days would not cause surprise.

St. Louis, March 12.—Iron and steel scrap is steady, with scattering demand and continued heavy consumption. A further slight gain was recorded in the melt. Available tonnages of scrap are not large, for while offerings by railroads have increased relatively little material is finding its way to this district. Buying competition in Chicago and points further east has resulted in the diversion of heavy tonnages from this center.

Birmingham, Ala., March 12.—Continued activity is noted in iron and steel scrap, with 60 days' delivery stipulated. Heavy melting steel buying is not as active as it has been, so far as the best quality is concerned.

Philadelphia, March 12.—Several moderate tonnages of No. 1 heavy melting steel have been sold at $16.50, which now represents the market. Forge scrap is somewhat higher, at $13.50 to $14.

Toronto, Ont., March 12.—Iron and steel scrap business as a whole is fairly brisk. Melters are buying for immediate needs and orders are in good volume. Some advance contracts have been placed, but forward buying, especially on long term contracts, is not encouraged by dealers. Both iron and steel grades have shown improvement.

Semifinished Steel

Supplies Continue Scarce—Market Is Firm

SEMIFINISHED STEEL PRICES, PAGE 732

Pittsburgh, March 12.—Continued high operations of finishing mills prevents any improvement in supply of semifinished steel. Mills offer little material and are not active in soliciting second quarter contracts. Non-integrated producers of finished products continue to encounter difficulty in obtaining sufficient steel for their mills. Although little is heard of premiums paid over existing prices, current quotations of $34 for 4 x 4-inch rerolling billets and slabs, and $35 for sheet bars are firm. Wire rods are in good demand at $42.

Chicago, March 12.—Semifinished steel still is scarce. Fewer quotations are made by producers in the open market because of the strong demand in their own finishing mills. Commercial billets, 4 x 4-inch base, are $35, Chicago. Sheet bars are $35, Chicago. Some sales of wire rods have been reported at $43, Chicago, or $42, Pittsburgh-Cleveland.

New York, March 12.—Several sales of billets have been made in this territory during the past week at an advance of $1 a ton over prices recently prevailing. The prices done the past week were $34, base, Pittsburgh, on open-hearth rerollers and $39 on standard open-hearth forging billets.

Cleveland, March 12.—Demand for semifinished steel continues brisk. The leading local merchant producer has now completed arrangements with its regular customers and is booked solid for the second quarter. Its open-hearth operations are held at 100 per cent, for the fourteenth consecutive month. Prices are firm.

Philadelphia, March 12.—Several moderate lots of billets were sold in the past week at the new prices of $34, base, Pittsburgh, for rerollers and $39 for forging quality. Some mills are not quoting billets due to the requirements of their own finishing mills. Certain mills are showing more eagerness to take wire rod orders, on which the price is $42, Pittsburgh.

Youngstown, O., March 12.—Demand for additional tonnages of sheet bars and billets is beginning to restrict the regular supply of wire rods. Outside makers of semifinished continue to be enlisted to supply the deficiencies of valley producers, although the latters' mills continue to be driven extra turns on Sundays, and at total rates exceeding rated capacities of open-hearth equipment. Sheet bars are firm at $35, Pittsburgh and Youngstown, billets $34 and wire rods $42, Pittsburgh and Cleveland.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Tons

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.50
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	13.00

Pig Iron

(*Concluded from Page* 733)

cago furnace, for the base grades.

St. Louis, March 12.—Inquiry for second quarter pig iron is gaining. Operations are particularly large at malleable shops, job foundries specializing in automobile parts and the car building establishments. Implement manufacturer also are busy. Sales reported the past few days aggregated approximately 15,000 tons. About 11,500 tons was booked by the St. Louis Gas & Coke Corp. The largest sale was 5000 tons of basic, to an east side mill. An Illinois car manufacturer took 1250 tons, and other equipment builders accounted for 1000 tons. A California malleable shop ordered 250 tons for second quarter, and an Iowa specialty, implement and stove maker ordered about 1000 tons. The market is very firm. Prices are firm. Febr-

Philadelphia, March 12.—Several round tonnages featured foundry iron sales in the past week. Numerous small lots also were booked. Several moderate tonnages of low phosphorus iron were booked. Prices are unchanged.

Birmingham, Ala., March 12.—A few inquiries are pending for pig iron for second quarter. Confidence is expressed that there will be as much iron melted during the next three months as in the first quarter. One or two companies are shipping as much iron as they are producing. The price continues $16.50, base, Birmingham, for first and second quarter.

Toronto, Ont., March 12.—With books opened for second quarter pig iron business, Canadian producers have taken large tonnages. Inquiry is good, indicating continued gain in contracts and a strong spot demand.

The Market Section

Bars

Heavy Demand Holds and Higher Second Quarter Price Stands Moderate Test

SPECIFICATIONS for soft steel bars are being filed in a flood, under the requirements of mills that March 15 is the deadline. Deliveries still are deferred. Shortage of semifinished material continues a deterring fact. Higher prices for second quarter are being applied on current small sales but lack a tonnage test. At Chicago, implement makers' needs have exceeded expectations.

BAR PRICES, PAGE 731

Chicago, March 12.—Prices are becoming secondary to deliveries, as buyers enter as extensive specifications as practicable to avail themselves of the best delivery promises. Producing units are under a strain to apportion enough semifinished steel to finishing mills to keep the latter's operations at a satisfactory pace. Even with near-capacity operations of bar mills, output could be crowded to a greater extent if semifinished supplies were available. All lines of bar consumption are active. Supplemental first quarter specifications of implement and tractor plants exceed even their own expectations. Automotive parts manufacturers are operating at a top mark, particularly to serve the lower priced cars. March and April automotive schedules, so far as this district is concerned, show little decline. The week just closed was the fourth best this year in finished steel specifications. Sales equal billings.

Second quarter contracting for soft steel bars is proceeding on the basis of 2.05c to 2.15c, Chicago, to miscellaneous buyers. This tends to indicate that higher prices for second quarter may not materialize. Rail steel bar mills are close to capacity operations. The rail steel bar price to the manufacturing trade is 1.95c, Chicago Heights.

New York, March 12.—Steel bar specifications are heavy and are expected to continue so this week. The market continues 1.90c to 2.00c, base, Pittsburgh, for first quarter contracts, but mills generally are quoting 1.95c as the minimum on new business, the new range being 1.95c to 2.05c, base, Pittsburgh. Importers are booking more business than usual. The current market on foreign bars is 1.90c to 1.95c, base, duty paid, tide water, plus size extras, which are approximately half of the American size extras. This range of prices on imported steel applies to the so-called Thomas steel, equivalent to basic-bessemer.

Pittsburgh, March 12.—Despite heavy specifications for hot-rolled merchant bars, mills see little evidence of anticipatory buying. Total volume of business holds well to the rate of previous weeks and despite high production mills have been able to improve little on delivery. Shipments generally are deferred three to four weeks. Much current business is for prompt shipment and mills encounter difficulty in meeting requirements. Contracting for second quarter is slow and although the new 1.95c price has received little test, on spot business it is well observed. Mills insist that all specifications against first quarter contracts be received by March 15.

Detroit, March 12.—Four to six weeks is the best delivery practically all makers of soft steel and forging bars can offer automotive users. One result is to compel users to shop among other than their regular sources of supply, but with little success. Specifications for March shipment indicate a higher daily rate than in February, with prospects of this rate holding into April, indicating that current automobile assembly rates will hold well into May, when the usual spring letdown would not be surprising. Makers are generally quoting 1.95c, Pittsburgh, for second quarter, but this advance of $1 has not yet received a test.

Cleveland, March 12.—Outside mills state their bar deliveries are becoming increasingly deferred. Their chief difficulty is in meeting wishes of their regular customers for increased allotments. Automotive demand is at the bottom of this sustained movement. On some sizes, deliveries are as much as four to six weeks deferred. Outside mills quote 2.00c, delivered, Cleveland, while local mills ask 1.95c, Cleveland.

Philadelphia, March 12.—Steel bar specifications are heavy and indications are the runover of specifications against first quarter contracts will take care of a large portion of second quarter consumption.

Plates

Market Strong, New Prices Applying—Car and Oil Tank Tonnages Increase

CURRENT plate demand is strong. Car builders and oil tank fabricators are increasing their orders. Chicago district mills continue operating at capacity, but are falling farther behind in deliveries. Oil tank inquiries at Chicago total about 12,000 tons. One order placed during the week calls for 4000 tons. About 5400 tons of plates and shapes are needed for 37 barges at Pittsburgh.

PLATE PRICES, PAGE 731

New York, March 12.—Miscellaneous plate demand continues good in this district. Some of the new orders are bringing the new minimum price of 2.05c, base, Coatesville. The 2.00c, base, Coatesville, price has not entirely disappeared. The full market range is 2.00c to 2.15c, base, Coatesville. About 300 tons of plates is wanted in the inquiry from the Standard Transportation Co. 26 Broadway, for two tug boats. Action is expected soon in connection with plate requirements for a new plant to be erected by Standard Oil Co. of New Jersey, at Paulsboro, N. J.

New York, March 12.—Standard Oil Co. of New Jersey has issued inquiries for another large tonnage of plates for Sarnia, Ont. An eastern car company has placed an order for about 1500 tons of universal plates for car construction.

Pittsburgh, March 12.—Plate specifications have increased moderately over the past month, with barge work continuing to predominate. New inquiries include that of the Wheeling Steel Corp. for 37 hopper-type barges requiring about 5400 tons of plates and shapes. Pending work involves a total of more than 30,000 tons. The new price of 1.95c to 2.05c for second quarter has received little test as few contracts have been signed.

Chicago March 12.—Plate mills, continuing at capacity operations, are getting farther behind on deliveries. Producers are unable to ship earlier than eight weeks on numerous orders. Car shop specifications are increasing steadily. Twenty-six hundred tons of oil storage plates were added to current inquiry, making the total 10,000 to 12,000 tons, largely for the West and Southwest. One order for oil storage tanks from the coast took 4000 tons. Empire Oil & Refinery Co. will erect a number of tanks as soon as details concerning the site at Indiana Harbor can be arranged. Gulf Refining Co. plans to spend $10,000,000 on improvements of its plant at Port Arthur, Tex. Except for tonnage differentials to the heavy users, plate buyers are specifying and contracting for second quarter on the basis of 2.05c to 2.15c, Chicago.

Cleveland, March 12.—Occasional plate awards up to 500 tons at a time are noted. Specifications for miscellaneous purposes are fairly steady. All first quarter tonnage is being

taken out. Second quarter bookings at 1.95c, Pittsburgh, have started. Word is received here of the award of tanks by the Gulf Refining Co., Staten Island, N. Y., taking 3500 tons of plates, to Riter-Conly Co. More locomotive shop tonnage is expected.

Philadelphia, March 12.—Plate demand continues active. Eastern mills quote 2.05c, base, Coatesville, minimum on new business, and up to 2.15c small lots. However, the 2.00c price and some differentials under that figure have not disappeared, and in some instances have been etxended. Inland Waterways commission will open bids in Washington April 8 on 50 barges, each requiring 450 tons of plates, shapes and bars.

CONTRACTS PLACED

5000 tons tank plates, awarded for Pacific coast oil storage.
3500 tons, oil tanks, Gulf Refining Co., Staten Island, N. Y., to Riter-Conley Co.

CONTRACTS PENDING

10,000 to 12,000 tons, miscellaneous lots for oil storage tanks in West Texas and Pacific coast.
5400 tons, plates and shapes, 37 barges for Wheeling Steel Corp.
1691 tons, siphon, Ellensburg, Wash.; bids received.
960 tons, plates and shapes, six coal barges for Island Creek Coal Co., Huntington, W. Va.; reduced from previous inquiry for 16 barges.

Bolts, Nuts, Rivets

Second Quarter Contracts Being Negotiated—Rivets Are Advanced

NUT AND BOLT PRICES, PAGE 732

Pittsburgh, March 12.—Bolt, nut and rivet producers are sending out second quarter contracts. Second quarter prices on bolts and nuts are unchanged at 60 to 70 off, with large rivets at 3.10c, Pittsburgh. The latter price is an advance of $2 a ton over first quarter contracts and although spot business has been light, some tonnage has been placed at the new figure .

Chicago, March 12.—Second quarter contracting for bolts, nuts and rivets is making an active start on the basis of first quarter quotations for bolts, nuts and small rivets and the new 3.20c, Chicago price, for large structural rivets. Specifications are holding up to February. The general rate of specifications is estimated at 10 to 15 per cent higher than in the past 24 months. Mill production is slightly higher at 70 to 75 per cent.

Philadelphia, March 12.—Rivet manufacturers generally are quoting 3.10c, base, Pittsburgh, for second quarter against the usual first quarter price of 2.90c.

Cleveland, March 12.—Slight progress is reported in booking second quarter needs in nuts and bolts. With no change in price, however, there was no spurt in specifications this month to close out contracts and it will largely be a matter of quiet renewal.

Pipe

Warmer Weather Brings Out Cast Pipe Business—Many Inquiries Current

SEASONAL activity is becoming more pronounced in cast pipe. Domestic makers won out over French makers in connection with Bloomington, Ill., award, despite the fact that the latter were $5 a ton cheaper. Five lots let in New England aggregate 3600 tons. Quotations hold firmly in Boston, Birmingham and Chicago. Southern makers are expanding their operations.

PIPE PRICES, PAGE 732

Chicago, March 12.—Bloomington, Ill., has awarded 10 miles of 24-inch high tensile cast iron pipe, about 6000 tons, to United States Cast Iron Pipe & Foundry Co. on a linear basis, which would amount to about $37 a ton, base, Birmingham. Concrete and steel pipe competition was sharp. Sellers of French pipe also were aggressive, bidding about $5 or more a ton under domestic figures. St. Paul took bids on about 1300 tons of 6 to 20-inch centrifugal pipe and Pontiac, Mich., has opened bids on 2600 tons of 6 to 16-inch. Arlington Heights, Ill., took bids on about 300 tons of 6 and 8-inch pipe while Roseville, Mich., takes bids tonight on 84,000 feet of 6 and 8-inch pipe. Open weather has induced contractors to order out shipments for spring work. Carlot business is moderately active. Carload prices for the larger diameters of cast pipe are steady at $45.20 to $46.20, Chicago.

Boston, March 12.—Pipe contracts closed in the past week aggregated 3600 tons of pipe, ranging from 6 to 16-inch in size. Prices are strong. Medford, Mass., rejected all bids on 300 tons. Boston awarded 2500 tons to the Warren Foundry & Pipe Co., which also was awarded 500 tons by Quincy, Mass. United States Cast Iron Pipe & Foundry Co. was awarded Springfield's 350 tons, while R. D. Wood Co. was awarded 150 tons by Concord, N. H. Prices show strength. For 4-inch pipe $49.10 is the current price, delivered to common Boston freight rate points, while for 6 to 16-inch, $44.10 is the quotation and 20-inch pipe is held at $43.60. A differential of $3 a ton on class A and gas pipe is named. Private business continues in excellent volume.

New York, March 12.—The local department of water supply will close general contracts shortly involving two lots of cast pipe aggregating approximately 1000 tons. It appears as if its direct purchase of supplies, to involve several thousand tons, will be postponed for at least another month. Municipal demand generally is spotty, with little fresh private inquiry noted. Prices are fairly steady.

Pittsburgh, March 12.—Demand for most grades of tubular products is steady although activity in welded material for the oil country continues slow. Seamless oil country pipe is in fair demand only and the outlook for substantial expansion in buying is not particularly bright. Mechanical tubing is active, particularly in specifications from the automotive field. Boiler tubing demand is fairly good.

Cleveland, March 12.—Standard full weight merchant pipe jobbers are filling up their stocks, bringing them into better balance. A splendid building program lies ahead and demand is expected to be heavy. Prices show firmness.

Birmingham, Ala., March 12.—Several cast iron pressure pipe shops here are operating practically full, producing steadily; others are on about a 60 to 75 per cent basis. Pipe is being accumulated for a heavy movement outward in the next few weeks. Lettings have been sluggish lately although some healthy specifications are reported. Quotations are firm at $37 to $38 for 6-inch and over sizes. Soil pipe manufacture is fairly good with bright prospects for improvement during next quarter.

CONTRACTS PLACED

6000 tons, comprising a 10-mile line og 24-inch pipe for Bloomington, Ill., to United States Cast Iron Pipe & Foundry Co., on a linear basis, amounting to about $37 a ton, base, Birmingham.
2500 tons, Boston, 6 to 16-inch pipe, to Warren Foundry & Pipe Co.
500 tons, Quincy, Mass., 6 to 12-inch pipe, to Warren Foundry & Pipe Co.
375 tons, class C pipe, Bloomfield, N. J., reported placed with R. D. Wood & Co.
350 tons, Springfield, Mass., 6 to 12-inch pipe, to United States Cast Iron Pipe & Foundry Co.
338 tons, 4 to 12-inch class B, Anaheim, Calif., to American Cast Iron Pipe Co.
150 tons, Concord, N. H., 6 and 8-inch pipe, to R. D. Wood & Co.
100 tons, Lowell, Mass., 6 and 8-inch pipe, to Lowell Iron & Steel Co.

CONTRACTS PENDING

2600 tons, 6, 8, 10, 12, and 16-inch pipe for Pontiac, Mich.; bids March 11.
1300 tons, comprising 4300 feet of 6-inch, 5000 feet of 8-inch, 1000 feet of 12-inch, 4000 feet of 16-inch, and 1000 feet of 20-inch pipe for St. Paul; bids March 12.
500 to 600 tons of cast pipe for department of water supply, gas and electricity, New York, for installation in Brooklyn, N. Y. General contractors' bids to be opened March 15.
500 tons, principally 12-inch cast pipe for department of water supply, gas and electricity, of New York. General contractors' bids to be opened March 19
494 tons, 6 to 12-inch class B, improvement State street, South Gate, Calif.; bids March 12.

300 tons, 6, 8 and 12-inch pipe, Medford, Mass. All bids rejected.
300 tons, 10,000 feet of 6-inch, and 4000 feet of 8-inch pipe for Arlington Heights, Ill.; bids March 11.
231 tons, 4 and 6-inch class B and C, improvement Massachusetts avenue, San Diego, Calif., to R. E. Hazard Contracting Co.
215 tons, 4 and 6-inch class C, improvement El Prado avenue, San Diego, Calif. Geo. R. Daley low bidder.
173 tons, 4 and 6-inch class C, improvement Lansing drive, San Diego, Calif., to R. E. Hazard Contracting Co.
144 tons, 4 and 6-inch class B, improvement Plata avenue, San Diego, Calif. Geroge R. Daley low bidder.

Tin Plate

Market Conditions Normal—Operations Averaging 85 Per Cent

TIN PLATE PRICES, PAGE 731

Pittsburgh, March 12.—Tin plate specifications and production are equal to or better than the usual rate for this period. Neither is expected to show much change for a few weeks, although the usual increase in specifications from canmakers is looked for in ensuing months. Operations are unchanged at 85 per cent.

Iron Ore

Prices Not Yet Determined—Large Consumers Negotiating

Cleveland, March 12.—Prices of Lake Superior iron ore have not been determined, although large consumers are anxious to know what their costs for this material will be. All users are giving attention to their requirements, and showing more interest in the market than has been noted for several years. With the inquiry from the Ford Motor Co., as reported a week ago, inquiries in the open market total about 1,000,000 tons. Lake navigation is likely to be opened in another month, and operators are eager to begin shipping as the tonnage of ore required this year, according to estimates at this time, will exceed last year's total. A strong pig iron and steel market situation points to an increase in the price of iron ore this year, though leading producers frankly say they have not yet made up their minds what to quote. Shipments of Lake Superior iron ore from Lake Erie ports and receipts in the past 12 months, and the dock balance as of March 1, reported by the Lake Superior Iron Ore association, are as follows:

Buffalo, No. Tonawanda,	Receipts	Shipments	Dock balance March 1, 1929
Port Colborne	4,337,313	22,016	2,991
Erie	653,233	666,161	59,645
Conneaut	8,437,401	8,369,979	1,602,718
Ashtabula	6,376,035	6,793,662	1,544,558
Fairport	1,839,171	1,967,896	211,569
Cleveland	9,375,764	6,234,817	1,019,168
Lorain	3,423,111	1,711,568	63,365
Huron	1,010,927	1,050,093	372,689
Toledo	1,503,387	840,264	62,714
Total	36,956,342	27,656,456	4,939,417
Comparative total 1 year previous	36,552,791	27,010,272	5,987,408

Sheets

Mills Scheduled Farther Ahead, Despite High Operations—Some Users Contracting at New Prices

PRESSURE for sheets has not been diminished, but on the contrary in some districts has been intensified. Many consumers are specifying heavily to be sure of material at an early date as possible. Some mills are scheduled at capacity to the latter part of June on some of the higher finishes. Operations in the Pittsburgh district are at 95 per cent.

SHEET PRICES, PAGE 731

Pittsburgh, March 12.—Sheet specifications increased in the past week, and show little tendency to drop far below the rate of production. Producers' backlogs continue at peak, and deliveries still are a source of trouble for consumers requiring material for prompt needs. Delivery on full finished sheets extends six weeks and more, and the volume of autobody material being placed now indicates automotive interests have large production schedules in view for May. Nothing is heard regarding an advance in autobody sheets, although it is expected following the advance of $1 a ton on sheet bars. The advance of $2 a ton on other grades of sheets has not received adequate test although some tonnage has been placed at the higher figures of 2.95c, base, Pittsburgh, for sheet mill black, 3.70c for galvanized and 2.20c for blue annealed. Tin mill black continues 3.00c and autobody 4.10c. Operations average about 95 per cent, which for some mills is practical capacity.

New York, March 12.—The majority of sheetmakers are quoting the advanced prices as their firm minimum figures, and consumers have recognized the new prices to some extent. Specifications on first quarter contracts have increased, and second quarter contracts have been closed at the higher prices. Much tonnage has been booked at the new prices.

Buffalo, March 12.—Operations of district sheets mills average more than 90 per cent of normal capacity. Orders for future delivery are large, and inquiry is broad. Prices are firm.

Detroit, March 12.—No letup in demand for sheets, especially full finished grades, is discernible. Weekly schedules of specifications are maintained by leading consumers. Practically nothing has been done thus far on second quarter contracts. Published prices for this delivery are 2.95c, Pittsburgh, for black, 3.70c for galvanized, 2.20c for blue annealed and 4.10c for autobody, but these levels have not been put to test.

Chicago, March 12.—In view of the delivery situation, sheet buyers are increasing individual specifications. Mill orders now are spreading over longer periods. Larger buyers have been contracting at the new prices. Outdoor roofing business, particularly in the Southwest is improving. Single prices now are being named instead of a range. Chicago delivered quotations are 3.10c for No. 24 black, 3.85c for No. 24 galvanized, and 2.35c for No. 10 blue annealed.

St. Louis, March 12.—Sheet business continues in satisfactory volume. Specifications for blue annealed are exceeding expectations.

Youngstown, O., March 12.—Independent sheet mills in this district continue at 98 per cent, but are not able to satisfy demand, especially for autobody sheets. Mill schedules for full-finished sheets now are reaching toward May, while makers of common grades are booked solidly for four to six weeks. Practically all the new business is for second quarter delivery. Hesitation on price frequently means the buyer has lost an opportunity for quicker delivery. Common black holds on all new business at 2.95c, Pittsburgh, galvanized at 3.70c, autobody at 4.10c and blue annealed at 2.20c.

Cleveland, March 12.—More business confronts sheetmakers, owing to soldup condition of mills. Many are unable to take full advantage of the situation. They are making every effort to supply their regular customers' expanded requirements, and are making no effort to develop new accounts. A buyer recently desired to close here on 500 tons of blue annealed sheets weekly. The mill could accept only 200 tons weekly. Buyers report they encounter a firm front everywhere at 2.20c, Pittsburgh. Several contracts have been signed for second quarter black and galvanized sheets at the new figures. Little highly finished tonnage is available before the latter part of June. The 4.10c, Pittsburgh price applies even on tonnages. Practically full operations prevail here. Railroads are buying more material.

Philadelphia, March 12.—Considerable first quarter sheet tonnage will extend into second quarter. The major portion of April requirements will be supplied at first quarter prices. This condition is reflected in the present situation whereby some mills have sufficient tonnage on their books to occupy them six weeks. On the other hand, a number of sheet contracts for second quarter were booked here in the past week at the new prices. While mills generally are well provided with tonnage there have been instances where they have had to go out to get some business to fill schedules.

Structural Shapes

Larger Units Grow in Number—Prospects Brightened Thereby—Awards Numerous—Specifications Active—Prices Firm

MORE large inquiries requiring structural material are taking form, including many bridges. Included are a $75,000,000 tunnel, a $32,000,000 bridge and 49,000 tons of subway work in New York and vicinity; two bridges near Buffalo taking about 10,000 tons apiece, together with a large number of buildings of various types scattered all over the country. The 12,000-ton country court house at Milwaukee will probably be let this week to the McClintic-Marshall Co. Awards this past week in the 1000 to 5000-ton class have been fairly numerous, including apartments, industrial buildings, schools, etc. Progress is reported by the mills in booking second quarter contracts at the new 1.95c, Pittsburgh, figure and first quarter specifications are growing numerous.

STRUCTURAL SHAPE PRICES, PAGE 731

New York, March 12.—Approximately 49,000 tons of subway work is expected to be closed shortly, following the recent legal settlement of general contracts on two projects, involving 35,000 and 14,000 tons respectively. The city has just appropriated $75,000,000 for subway construction this year. New inquiry generally is expanding . Local fabricators expect March business to be substantially in excess of either January or February. Prices continue strong with some second quarter business on shapes being closed at $1 higher than the present range of 2.145c to 2.195c, New York.

February structural bookings in the New York metropolitan district amounted to 24,700 tons, as against 27,000 tons in the preceding month exclusive of piers, bridges and subways. Through error last week this publication reported an increase in February bookings, as compiled by the local structural steel board of trade.

Board of estimate yesterday approved construction of the Brooklyn-Richmond tunnel, costing approximately $75,000,000, and the tri-borough bridge, linking Manhattan, Bronx and Queens by a span across the East river at Hell Gate, costing $32,000,000.

Four local projects, involving an aggregate of 29,000 tons, are expected to be placed at once. The largest of these is the American Exchange-Irving Trust Co. building, 13,000 tons.

The local board of transportation will issue specifications, March 14, for subway section 6, route 107, Brooklyn, involving 800 tons of shapes, 210 tons of bars and will issue specifications shortly after that an subway sections three and four, route 108, Manhattan, requiring a substantial tonnage. Shapes are quoted at 2.145c to 2.245c, New York.

Buffalo, March 12.—One of the largest structural projects to come out here in a long time involves the construction in 1930 of two bridges over the Niagara river between Grand Island and the American mainland. A commission has been named to survey the sites.

Philadelphia, March 12.—Structural shape demand continues good but prices now quoted do not reflect the recent advance. Current quotations on the usual run of business are 1.90c to 2.00c, base, eastern mill, with differentials on especially attractive business. This makes the delivered price at Philadelphia about 2.01c to 2.06c. In some cases protections against shape tonnages pending are being extended.

Pittsburgh, March 12.—Specifications for plain structural material show little change. Although new inquiry is slightly more active, it is not brisk. Little opportunity has been provided to test the recent advance of $1 a ton since most large users are under contract and there has been little activity as yet in second quarter contracting.

Cleveland, March 12.—Locally structural shape awards are at low ebb. Some projects are up, however, for early closing and on these fabricators focus their attention. Included is the National Cash Register Co.'s building at Dayton, O. Contract for the Ohio Bell Telephone Co.'s building at Akron, O., has been let to Berger Iron Works. It is understood here that the Libbey-Owens Sheet Glass Co.'s building, Toledo, O., 3000 tons, went to Rochester Bridge Co.

Chicago, March 12.—Fabricators of plain structural material, influenced by the generally lengthened deliveries of finishing mills, are taking heavier specifications of stock-length material. Interstate Iron & Steel Co. closed on 2500 tons, and other inquiries are under way. Shape deliveries are easier than in bars and plates, but now are expanding to four weeks in some sizes and sections. The price of 2.05c to 2.15c, Chicago, prevails except in tonnage differentials.

Awards Compared

	Tons
Awards this week	33,571
Awards last week	55,933
Awards two weeks ago	34,439
Awards this week in 1928	52,690
Average weekly awards, Feb.	33,361
Average weekly awards, 1928	39,082
Average weekly awards, 1929	35,533
Total awards to date, 1928	500,191
Total awards to date, 1929	390,863

CONTRACTS PLACED

6000 tons, Damen avenue, bridge, Chicago, to American Bridge Co. Noted as 4500 tons in Feb. 28 issue if IRON TRADE REVIEW.

3000 tons, mill building for 10-inch bar mill, Inland Steel Co., Indiana Harbor, Ind., to McClintic Marshall Co.

3000 tons, plant, Libbey-Owens Sheet Glass Co., Toledo, O. Reported awarded Rochester Bridge Co.

2900 tons, building, Eighth avenue and Thirty-fifth street, New York, to Hedden Iron Construction Co.

2000 tons, exchange building, Ohio Bell Telephone Co., Akron, O., to Berger Iron Works, through W. J. Schirmer & Co., general contractors.

1880 tons, power house addition, United Illuminating Co., New Haven, Conn., to Levering & Garrigues Co.

1800 tons, addition, Illinois Bell Telephone building, Chicago, to American Bridge Co.

1600 tons, school of education, New York university, Fourth avenue and Greenwich street, New York, to American Bridge Co.

1300 tons, building, Alamo National bank, San Antonio, Tex., to Alamo Structural Steel Co.

1150 tons, college of pharmacy, Brooklyn, N. Y. to George A. Just Co.

1000 tons, power plant, Annheuser Busch, Inc., St. Louis, to Banner Iron Works.

950 tons, Van Castle apartments, Tarrytown, N. Y., to Muglers Iron Works; this was previously noted as involving 1500 tons and as going to an unnamed fabricator.

838 tons, rebuilding bridge at Holyoke, Mass., Boston Maine railroad, to Boston Bridge Works. Several thousand tons additional to be bought to replace bridges in western Massachusetts.

825 tons, plant, Rundel Mfg. Co., Camden, N. J., to McClintic-Marshall Co.

765 tons, apartment, Clay and Jones streets, San Francisco, to Judson-Pacific Co.

750 tons, Sterling hotel, Wilkes-Barre, Pa., to Anthracite Bridge Co.

740 tons, warehouse, Washington, Pa., to American Bridge Co.

660 tons, plant addition, Crane Co., Bridgeport, Conn., to American Bridge Co.

600 tons, section No. 1, Canadian end, Detroit-Canada tunnel at Detroit, to Russel Steel Construction Co., through Barklay Construction Co.

600 tons, building, Cambridge Tile Co., Cincinnati, to Dayton Structural Steel Co.

600 tons, bridge work for Missouri Pacific railroad, to American Bridge Co

560 tons, St. Benedict's convent, Lisle, Ill., to Midland Structural Steel Co.

550 tons, warehouse, West 230th street, New York, to Kues Bros.

525 tons, St. Vincent's hospital, Staten island, New York, to Guibert Steel Co.

500 tons, building, National Electric Products Corp., Bayway, N. J., to Jones & Laughlin Steel Corp.

300 tons, test building addition, Pittsburgh, to McClintic-Marshall Co.

275 tons, alterations Kauffman's Stores Inc., Pittsburgh, to McClintic-Marshall Co.

250 tons, addition, General Electric Co., West Philadelphia, Pa., to Bethlehem Construction Co.

250 tons, building, Ferry hall, Lake Forest, Ill., to Gage Structural Steel Co.

250 tons, stage, Paramount Co., Marathon ave-

nue, Los Angeles, to Consolidated Steel Co.
250 tons, breaker plant for Lehigh Coal Navigation Co., Hazleton, Pa., to Bethlehem Steel Corp.
225 tons, plant, Pressed Steel Co., Worcester, Mass., to Eastern Bridge & Steel Co.
215 tons, addition municipal power house, Lynn, Mass., to Eastern Bridge & Steel Co.
200 tons, transformer stations, Cleveland Union Terminals Co., Cleveland, to City Iron Works.
200 tons, apartment, Arch street, Berkeley, Calif. to Golden Gate Iron Works.
200 tons, addition, rolling mill, Columbia Steel Corp., Pittsburgh, Calif., to McClintic-Marshall Co.
200 tons, office building addition, United States Steel Corp., 71 Broadway, New York, to American Bridge Co.
190 tons,bridge, Norfolk & Western railroad in West Virginia, to American Bridge Co.
175 tons, garage, Beaver Falls, Pa., to Guibert Steel Co.
160 tons, New York Central bridge, Depew, N. Y., to American Bridge Co.
160 tons, track elevation, Pennsylvania railroad, West Philadelphia, Pa., to Bethlehem Steel Co.
160 tons, bridge, New Jersey state highway commission, Trenton, N. J., to Rust Engineering Co.
155 tons, addition, Meyercord Co., West Lake street and North Long avenue, Chicago, to American Bridge Co.
143 tons, industrial building, Bowman Construction Co., Marion, Ind., to Insley Mfg. Co.
135 tons, double-track bridge, Pennsylvania railroad, Girard Point, Philadelphia, to Bethlehem Steel Co.
125 tons, miscellaneous work, including 65-ton addition, Industrial Rayon Corp., Cleveland, to Republic Structural Iron Works.
120 tons, Detroit-Union Produce Terminal, Detroit, to Russel Steel Construction Co., through Dwight P. Robinson & Co. Inc.
120 tons, hotel addition, O'Farrell street, San Francisco, to McClintic-Marshall Co.
120 tons, apartment, Vallejo and Octavia streets, San Francisco, to McClintic-Marshall Co.
100 tons, new unit, Beacon Oil Co., Everett, Mass., to Boston Bridge Co.
100 tons, building, Cathage Mills Co., Cincinnati, to McClintic-Marshall Co.

CONTRACTS PENDING

35,000 tons, subway sections one and two, route 103, Manhattan, New York, legal restrictions cleared away enabling city to award contract to the Corson Construction Co., low bidder, should it so desire.
14,000 tons, subway section 1 and 2, route 110, Brooklyn, N. Y., award of general contract to Carlton Construction Co. established.
12,000 tons, Milwaukee county court house. Joint committee of county board voted March 8 to recommend acceptance of McClintic-Marshall Co.'s bid of $786,900. County board meets March 12.
5000 tons, Cleveland municipal stadium. D. M. McKesson Co., Cleveland, has contract for making borings at site. Osborn Engineering Co., Cleveland, collaborating with City Engineer Robert Hoffman on plans.
4500 tons, Allegheny County building, Pittsburgh; S. M. Siesel Co. awarded general contract.
4300 tons, column cores, warehouse in Canal street for Schroeder & Koppel, New York.
3000 tons, office building, sheet jobbing mill, power house and other buildings for Inland Steel Co., Indiana Harbor, Ind.
3000 tons, Reading railroad bridge, Muncy, Pa.
2850 tons, *New York Herald-Tribune* building, Forty-first street, New York; bids in; previously noted as involving 2000 tons.
2500 tons, John Marshall high school, Chicago. General contract awarded Great Lakes Construction Co.
2200 tons, building, National Cash Register Co., Dayton, O. Out for figures March 16.
2000 tons, grst section, Plaza subway, Philadelphia; bids being taken.
2000 tons, car shops Rio de Janeiro, Brazil. Bids being taken by United States engineers and constructors on behalf of Dwight P. Robinson & Co. of Brazil.
1505 tons, bridge, West Spokane street, Seattle. General Construction Co. low bidder on general contract.
1000 tons, 24-story office and bank building, Central Savings & Trust Co., Akron, O.
900 tons, highway bridges for Minnesota.
800 tons, 15-story apartment, 328 East Fifty-sixth street, New York.
750 tons, store building, Evanston, Ill., for Marshall Field & Co., Chicago.
520 tons, nurses' home and hospital addition, Providence, R. I.
315 tons, two state bridges at Lighthall and Maryland, New York, respectively.
300 tons, three schools, Pekin, Ill. Royer, Donley & Smith, architects.
300 tons, Union Park hotel, Warren boulevard, Chicago. General contract to Arthur A. Klein & Co.
285 tons, transfer bridge for municipal carferry terminal on Jones island, Milwaukee. Bids close March 21.
257 tons, bridge across Yakima river, Ellensburg, Wash.; bids received.
250 tons, bridge, Lehigh Valley railroad, Cheektowaga, N. Y.
250 tons, three bridges on Pittsburgh division of Boston & Maine railroad.
200 tons, bridge, at Avon, Conn.
200 tons, Gilchrist private hospital, 160 West Thirty-sixth street, New York.
200 tons, orphans' home, 225th street, New York.
200 tons, 4-story hospital addition, Morris avenue, Bronx, New York.
105 tons, Malheur river bridge, Portland, Oreg.; bids received.
100 tons, administration building, Cleveland airport, Brook Park, O. General contract to Reaugh Construction Co.
100 tons, building addition for Numis Metric society, West Fifty-fifth street, New York, Marc Eidlitz, general contractor.
100 tons, Hoboken Savings bank, Hoboken, N. J. Ludlow & Peabody, New York, architects.
Unstated tonnage, car repair shop, 200 x 1000 feet, Chicago, Milwaukee, St. Paul & Pacific Railway Co., West Milwaukee, Wis. Bids taken March 27 by C. F. Loweth, chief engineer, Union station, Chicago. C. N. Bainbridge, Chicago, is engineer of design.
Unstated tonnage, two 4-story units, Hoover Suction Sweeper Co., North Canton, O., to cost $225,000.
Unstated tonnage, three buildings Electric Auto-Lite Co., Toledo, O., to cost $350,000.
Unstated tonnage, terminal, Fruit Terminal Co., Columbus, O., to cost $3,000,000.
Unstated tonnage, lead reclaiming plant, United States Chemical Products Co., Pawtucket, R. I. Permission granted. Will ask for bids soon.
Unstated tonnage, municipal building, Hastings-On-Hudson, N. Y. Shreve & Lamb, New York, architects.
Unstated tonnage, clubhouse, City Temperance society, 162 East 124th street, New York. E. A. Walker, New York, architect.

Concrete Bars

Inquiries Grow in Number and Size—Awards Fairly Numerous—Prices Firm

PROJECTS calling for the use of concrete bars grow more numerous as the second quarter approaches. Included are road work in Missouri, Illinois and elsewhere, scattered buildings, bridges, etc. Chicago and New York report considerable activity in buildings in the 100 to 500-ton range. Prices, except in Cleveland, appear to be firming up somewhat.

REINFORCING BAR PRICES, PAGE 731

Chicago, March 12.—Reinforcing bar orders for highway work are taking form. Contracts for 43 miles of Illinois highway work have just been awarded to the Clinton Bridge Co. which will involve close to 1200 tons of reinforcing bars and mesh. While the general volume of reinforcing bar tonnage for building work is below last year, the number of large awards since the first of the year is noteworthy. Two jobs of between 400 and 500 tons each were awarded, making nearly a half dozen individual jobs of around 500 tons in the past 10 days. Rail steel bar fabricators are holding to the 2.05c quotation.

Chicago building permits in February for 236 units, costing $8,756,300, represented the smallest total for that month in 10 years.

Pittsburgh, March 12.—Specifications to the mills for concrete reinforcing bars show gradual expansion. Distributors continue to operate on small stocks and business placed with mills largely represent actual jobs, mostly small activity in this district continues restricted. Building operations increase slowly. Inquiry shows but little improvement. Prices at 2.25c, Pittsburgh, for cut lengths and 2.00c for stock lengths are well observed.

Buffalo March 12.—Signs point to a heavy covering of both old and new reinforcing bar inquiry the latter part of this month. Small lot sales are good with the price at Buffalo warehouses 2.515c. Steelworks are increasing their reinforcing bar output to keep pace with current demand and to meet the heavy buying expected later on in the month.

Cleveland, March 12.—While most awards in concrete bars involve inconsequential tonnages, the largest lot to be let in several weeks has been purchased by W. J. Schirmer & Co., here, general contractors on the exchange building for the Ohio Bell Telephone Co. at Akron, O. This tonnage went to the Bourne-Fuller Co., here. Occasional price concessions are made under the usual figures usually quoted, namely 1.95c to 2.00c, Pittsburgh, on mill lengths. From 2.25c to 2.44c, Cleveland, are figures named on billet rolled bars from warehouse stocks. Rail steel bars are at 1.95c, mill, minimum.

St. Louis, March 12.—One of the largest lettings of contracts for road construction since the organization of the state highway department of Missouri, will be held at Jefferson City, Mo., by Chief State Engineer Cutler on March 15. Contracts to be bid

Awards Compared

	Tons
Awards this week	7,347
Awards last week	6,550
Awards two weeks ago	3,490
Awards this week in 1928	9,280
Average weekly awards, Feb	4,716
Average weekly awards, 1928	6,189
Average weekly awrds, 1929	6,291
Total awards to date, 1928	67,655
Total awards to date, 1929	69,200

upon will include 38 bridges and will amount to about $4,000,000.

CONTRACTS PLACED

1500 tons, Carquinez Straits bridge, Southern Pacific Co., San Francisco, to unnamed interest, through Siems, Helmers Shaffner. Inc., St. Paul, general contractor.
1000 tons, Hillcrest Arms apartment, Toledo, O., to Hausman Steel Co., successor to the Building Products Co.
900 tons, apartment, North Rossmore street, Los Angeles, to unnamed interest.
550 tons, Holland Plaza building, Watts street, New York, to Carroll-McCreary & Co. Inc.
525 tons, apartment at Hinman and Grove avenues, Evanston, Ill., to Concrete Steel Co., previously reported to unstated fabricator.
525 tons, exchange building, Ohio Bell Telephone Co., Akron, O., to Bourne-Fuller Co., through W. J. Schirmer & Co., general contractors.
500 tons, school building, Carmen avenue, Chicago, to Concrete Steel Co.
450 tons, building for American Exchange-Irving Trust Co., 1 Wall street, New York, to Concrete Steel Co., through Foundation Co.
422 tons, Leader store, West Twenty-sixth street, Chicago, to Calumet Steel Co.
400 tons, Memphis, Tenn., store for Sears, Roebuck & Co., Chicago, to Laclede Steel Co.
300 tons, Houston, Tex., store for Sears, Roebuck & Co., Chicago, to Laclede Steel Co.
250 tons, garage, Chicago, to Concrete Steel Co.
200 tons, apartment, Grammercy place, Los Angeles, to Blue Diamond Co.
175 tons, apartment building on Twenty-first street, Chicago, to unstated fabricator.
175 tons additional, Westchester County Center building, White Plains, N. Y., to Carroll-McCreary & Co. Inc.

CONTRACTS PENDING

1200 tons, reinforcing bars and mesh for 43 miles of Illinois highway work, Springfield, Ill., to be purchased by Clinton Bridge Co.
550 tons, piers for Kill Van Kull bridge, New York. General contracts to P. T. Cox Contracting Co. for piers on the New Jersey side, and to Arthur McMullen Co. for piers on the New York side.
500 tons, warehouse, Saks & Co., Bronx, N. Y.
185 tons, bridge, West Spokane street, Seattle. General Construction Co. low bidder on general contract.
154 tons, bridge over Yakima river, Ellensburg, Wash.; bids received.
125 tons, bridge over Mill creek, Salem, Oreg.; bids March 18.
100 tons, Allegheny County building, Pittsburgh. General contract to S. M. Siesel Co.

Steel Bookings Up Again

For the third consecutive month unfilled bookings of the United States Steel Corp. increased, the total as of Feb. 28 amounting to 4,144,341. This is a gain of 34,854 tons or 0.84 per cent. Last month's total was the largest since March 31, 1928, when unfilled bookings amounted to 4,335,206. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Feb. 28, 1928	4,144,341	34,854+	0.84	+
Jan. 31, 1929	4,109,487	132,775+	3.34	+
Dec. 31, 1928	3,976,712	303,712+	8.25	+
Nov. 30, 1928	3,673,000	78,030—	2.80	—
Oct. 31, 1928	3,751,030	52,662+	1.42	+
Sept. 30, 1928	3,698,368	74,325+	2.05	+
Aug. 31, 1928	3,629,042	53,116+	1.40	+
July 31, 1928	3,570,927	66,082—	1.81	+
June 30, 1928	3,637,009	220,187+	6.45	+
May 31, 1928	3,416,822	455,311—	11.70	—
Apr. 30, 1928	3,872,133	463,073—	10.70	—
Mar. 31, 1928	4,335,206	62,983—	1.43	—
Feb. 29, 1928	4,398,189	122,242+	2.80	+
Jan. 31, 1928	4,275,947	303,073+	7.62	+
Dec. 31, 1927	3,972,874	518,430+	15.00	+
Nov. 30, 1927	3,454,444	113,404+	3.39	+
Oct. 31, 1927	3,341,040	192,921+	6.10	+

Rails, Cars

Car Lettings Shrink—Live Inquiries Grow—Pennsylvania to Buy Track Material

WHILE past week was quiet from a car award standpoint when contrasted with recent weeks, prospects are bright with inquiries pending showing more life. Northern Pacific now asks bids on 1200 and Nickel Plate on 250. Pennsylvania closed bids on track material. Fresh rail awards are limited but deliveries are heavier as mill operations increase.

RAILROAD TRACK PRICES, PAGE 732

New York, March 12.—While lacking the large contracts of a week ago, car buying continues promising. Builders are figuring on substantial specifications. Complete returns place freight car buying in February at 15,944, bringing the total for the first two months up to 29,140. Comparisons follow:

	1929	1928	1927	1926
Jan.	13,196	4,160	14,710	8,830
Feb.	15,944	10,220	5,960	12,895
Total (2 mos.)	29,140	14,380	20,670	21,725
March	.....	2,958	4,955	8,895
April	.....	6,043	3,675	4,615
May	.....	2,531	5,425	4,448
June	.....	2,422	7,440	4,285
July	.....	582	2,295	1,265
Aug.	.....	677	1,181	152
Sept.	.....	1,378	682	3,335
Oct.	.....	2,853	886	2,840
Nov.	.....	6,140	1,189	3,925
Dec.	.....	4,799	14,897	8,990
Total	.....	44,763	63,295	64,475

Approximately 10,000 freight cars now are pending, including 270 coaches.

Pittsburgh, March 12.—Pennsylvania railroad closed bids March 12 under provisions of the Clayton act on 4000 tons of tie plates and 16,500 kegs of spikes for its second quarter requirements. Specifications for track fastenings show little change. Light rail demand is steady but light.

Chicago, March 12.—Rail mills here maintain operations virtually at capacity. Rail tonnage has spread more widely throughout the season than in the past several years. Track fastenings tonnage placed totaled nearly 6000 tons, but no new rail buying is reported.

In addition to the 25 caboose cars announced a week ago, Illinois Central has purchased 34 additional passenger and baggage cars, and four electric locomotives. Northern Pacific is inquiring for 1200 cars, including 500 each gondolas and automobile, and 200 flats, in addition to five mail and express cars placed on inquiry a week ago. Chicago, Rock Island & Pacific will build 500 steel underframes for box cars in its own shops at Armourdale, Kans. It is expected that western car shops will share in awards of both the Erie and New York Central.

Philadelphia, March 12.—Eastern railroads now are taking in large tonnages of rails and track accessories against contracts recently placed. Chesapeake & Ohio is taking bids on 3000 tons of plates, shapes and bars for second quarter.

CAR ORDERS PLACED

Chicago, Rock Island & Pacific, 500 box car underframes, to Armourdale, Kans., shops.
Illinois Central, 34 miscellaneous coaches, awarded as follows: 10 passenger and eight chair cars to American Car & Foundry Co. and six baggage and mail, five baggage and express and five horse express cars to St. Louis Car Co.
New York, New Haven & Hartford, 174 miscellaneous coaches to unstated builder, comprising 90 passenger, 10 combination passenger-express, 15 combination mail, six diners, 20 gasoline electric coaches and 24 trailers, three multiple coaches, six multiple trailers. Order involves $6,500,000.
Richmond, Fredericksburg & Potomac, passenger trailer car, to J. G. Brill Co.
South Australian Railway, eight gasoline rail motor cars, to J. G. Brill Co.
St. Louis-Southwestern, 15 caboose car underframes, to Virginia Bridge & Iron Co.
Union Tank Car Co., 300 tank cars to American Car & Foundry Co.

LOCOMOTIVE ORDERS PLACED

Illinois Central, four electric locomotives to Westinghouse Electric Mfg. Co.
Pere-Marquette, 10 locomotives to Baldwin Locomotive Works.
Southern Pacific, 16 locomotives to the Baldwin Locomotive Works.

CAR ORDERS PENDING

Baltimore & Ohio, five dining cars and seven parlor cars; these are in addition to 125 miscellaneous coaches previously noted as pending.
Baltimore & Ohio, 122 cars, including, 100 express, 15 baggage and seven cafe parlor cars.
Chesapeake & Ohio, three mail and express cars.
Chicago, Rock Island & Pacific, 100 underframes for ice cars.
Erie, 30 suburban coaches, inquiry formally issued.
Mississippi Central, 50 each 40-ton automobile and 40-ton box cars.
Nashville, Chattanooga & St. Louis, 150 gondolas and 50 hoppers.
Nickel Plate, 250 50-ton gondolas.
Northern Pacific, 200 flat cars.
Northern Pacific, 1200, including 500 gondolas, 500 automobile and 200 flats.
Southern Pacific, 50 caboose cars.
Southern Pacific, 300 flat cars in addition to 56 cabooses.

LOCOMOTIVE ORDERS PENDING

New York, Ontario & Western, 10 locomotives and six extra tenders.
Illinois Terminal railroad, three locomotives.

Chromium steels containing about 1 per cent chromium and 1 per cent carbon largely are utilized in the manufacture of shoes and dies for stamping mills and for burglar-proof safes.

Wire

Contracts for Second Quarter Being Signed at New Prices—Manufacturers Best Buyers

SECOND quarter contracting is going on steadily, with manufacturers leading in size of commitments. Fencing is selling more actively in areas where weather allows outdoor work. Some makers find backlogs increasing under heavier buying. Nails fail to improve in demand. Prices are steady and less resistance is being encountered. Contracts are being extended in many cases.

WIRE PRICES, PAGE 732

Chicago, March 12.—Steady progress is being made in second quarter contracting for wire products. Contract tonnage for manufacturers' wire is heavy. Woven fencing demand is picking up in some north central districts. Wire nail demand remains slow. Quotations to large jobbers are 2.55c, Chicago or western mills, for bright plain wire, and $2.70 for wire nails.

Worcester, Mass., March 12.—Demand for specialty wire products continues to feature this market, although opening of spring construction has resulted in a slight stepup of specifications for plain wire. Prices are steady at 2.75c, Worcester base, to dealers and second quarter contracting is gradually expanding. Mills are generally working closer to actual consumption of wire goods.

Buffalo, March 12.—Good demand for wire products is reported here. Road builders are placing large mesh orders for delivery when weather conditions will permit construction. Spring seat wire for the automobile trade is a large seller. Eastern wireworks are operating on good schedules. All wire prices are firm.

Pittsburgh, March 12.—Wire specifications are slightly more active and mills have added moderately to backlogs. Nails continue inactive and business has been disappointing. This is largely a reflection of restricted demand in building operations and of the heavy buying during the fourth quarter before the price advance of $2 a ton. Manufacturers' wire leads other products, with fencing demand slow to improve. Contracting for second quarter is well along with about one-half the trade signed up at current figures of 2.50c to 2.60c for plain wire, and $2.65 to $2.75 for nails. In a number of cases old contracts merely are being extended, since some consumers did not take full quotas. Heavy anticipation of first quarter requirements restricted new buying during that period but improvement is looked for from that standpoint during the second quarter.

Cleveland, March 12.—Specifications against wire products contracts booked before the last advance have been so liberal that these obligations have been largely filled. Some contracts for small tonnages have been booked at the new figures. Wire mill operations are high, averaging 85 per cent or more.

Cold Finished Steel

Little Resistance to Higher Second Quarter Price

COLD FINISHED PRICES, PAGE 731

Pittsburgh, March 12.—Cold-finished steel bar producers are encountering a minimum of opposition on 2.30c, Pittsburgh, for second quarter contracts. This represents an advance of $2 a ton over first quarter. Specifications continue fairly steady and only slight increased business is ascribed to the desire of consumers to anticipate April requirements. Mills are adhering to the decision that all specifications against first quarter contracts must be received by March 15. Automotive interests continue active specifiers although farm implement and machinery manufacturers are good buyers.

Detroit, March 12.—Though little second quarter contracting has been done, all makers of cold finished bars quote 2.30c, Chicago, or 2.575c, delivered, Detroit. Pressure for prompt delivery continues insistent.

Cleveland, March 12.—Specifications have been so heavy in closing first quarter cold finished bar contracts that customers are well supplied with tonnage. They show little interest in second quarter contracts at the $2 per ton advance. All makers quote 2.35c, Cleveland, however, and reaffirm that that is the market.

Domestic mining of chromite had its inception in 1827.

Strip

Makers Unable to Improve Deliveries by Capacity Production—Prices Hold Firmly

CAPACITY production by many makers of strip steel have not sufficed to reduce backlogs and deliveries still are far behind. Seven weeks is the earliest possible delivery for some sizes of hot-rolled strip. At Chicago, lack of semifinished steel is keeping strip production below capacity. Prices are holding at current levels without signs of weakness.

STRIP PRICES, PAGE 732

Pittsburgh, March 12.—Pressure on strip steel producers for material shows few signs of lessening. Demand is well maintained for both hot and cold-rolled material and despite capacity operations backlogs have not been reduced. Delivery on some narrow sizes of hot strip continues furthest deferred at about seven weeks, and five weeks is the shortest possible time obtainable from some mills on cold-rolled material. Contracting is fairly active, with 2.00c and 1.90c, respectively, well maintained on hot strip to 6 inches and sizes over 6 inches to 24-inch. Cold-rolled contracts are based on current prices at 2.75c to 2.85c.

Chicago March 12.—Users of hot rolled strip steel, placing delivery paramount to price, are reported to be paying premium in some cases for small lots for early shipment. Hot strip mills are at about 95 per cent. Automotive demand from producers of higher priced cars is slightly below expectations.

Hot rolled strip prices are 2.20c to 2.30c, Chicago, for 6 inches and under, and 2.10c to 2.20c for 6 1/16 to 24-inch material. Second quarter price for cold rolled is reported on a firm basis at 2.85c, Pittsburgh-Cleveland.

Philadelphia, March 12.—Indications are that a large portion of the strip tonnage to be consumed in second quarter will be obtained against run-overs on first quarter contracts. Hence the recent advance has not affected many consumers so far, and no test is imminent.

Youngstown, O., March 12.—Demand for strip, both hot or cold-rolled, is unprecedented with makers in this district. Production records are being broken on hot mills, one with an output of 5400 tons last week surpassing its former record of 4800 tons.

Cleveland, March 12.—Strip steel backlogs are growing. Hot strip in some cases is not available before April 15 and in other instances, April 22 is the earliest date offered. Automotive and other manufacturing activities specify liberally. Cold strip is four to six weeks or more deferred. Prices are firm. Some cold strip makers have a minimum of 2.85c, Cleveland-Pittsburgh, for all tonnages; others quote 2.75c on larger lots. Hot strip is unchanged and firm at 1.90c to 2.00c, Pittsburgh.

Nonferrous Metals

Copper Prices Rise Half Cent on Publication of February Statistics—Zinc Stocks Drop—All Consumption Heavy

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. Louis	Zinc: St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Mar. 6	19.50	19.57½	19.25	48.60	48.75	7.25	7.15	6.35	23.90	9.27½	35.00
Mar. 7	19.50	19.57½	19.25	48.57½	48.70	7.25	7.15	6.35	23.90	9.27½	35.00
Mar. 8	19.50	19.57½	19.25	48.87½	49.00	7.25	7.15	6.35	23.90	9.27½	35.00
Mar. 11	19.50	19.57½	19.25	48.75	48.75	7.25	7.15	6.35	23.90	9.25	35.00
Mar. 12	20.00	20.07½	19.50	48.50	48.55	7.25	7.15	6.35	23.90	9.25	35.00

NEW YORK, March 12.—Consumption and production of all nonferrous metals are running higher than ever before. Prices accordingly are strong and delivery periods are being lengthened.

Copper prices were advanced a half cent, delivered Connecticut basis, on Tuesday following publication of the strong statistical report for February. The rise was accompanied by an increase on brass and copper products by the American Brass Co. Brass products were stepped up ⅜-cent, copper products ⅝-cent, and copper wire and cable a half cent.

Talk of an expected increase in demand and rise in prices were heard in the zinc market on Tuesday after publication of the strongest statistics for any February on record.

Statistics on tin two weeks ago showed that deliveries in the first two months of this year in the United States were larger than ever before. Statistics on lead for February are not yet known but the unusual strength in the price lately, a rise of ¾-cent so far this year, indicates the way demand is taking up production.

Specifications now reaching the brass and copper mills on their products against previous orders are extraordinarily heavy. Some salesmen report the heaviest specifications they have ever seen. A few departments of the mills have found it necessary to operate on Sunday to keep up with demand. Other departments are operating far above normal. It is probable that shipments of copper and of copper products in March will exceed by wide margin anything done previously in the industry.

Copper—Stocks of refined copper in the hands of producers at the end of February totaled 55,213 tons compared with 62,749 tons at the end of the preceding month. This cut in stocks was greater than generally expected. Stocks of blister copper also declined sharply. Shipments of refined copper during the past month set a new record for February both in the total and domestic movements. Output of refined metal was at the daily rate of 5049 tons, a rate surpassed only once previously. Domestic buying of copper in the past week has been light, mostly for June shipment. Export business on most days also has been light with sales mostly for May shipment.

Tin—Users have bought moderately of Straits tin in the past week. A fair proportion of the business has been for nearby positions, and some for several months ahead. The market has lacked snap, and has shown a tendency to slump. Despite the unusual consumption in this country, spot supplies here continue plentiful and world production still seems to be doing better than keeping pace with demand.

Aluminum—Shipments of aluminum are large and sellers are well sold ahead. Prices are firm but unchanged.

Zinc—Prime western continues at 6.35c, East St. Louis. Buying has been of a routine nature, and yet producers say that business is of satisfactory size. Some sales have been made several months ahead. High-grade zinc is unchanged and shipments are extremely large. Stocks of slab zinc declined during February to the lowest total for the close of any month since November, 1927. Total output during the past month declined from the aggregate tonnage for the preceding month but domestic shipments increased and established a new February record.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	24.12½
Copper, hot rolled	29.75
Lead, full sheets (cut ¼c more)	9.75
Zinc sheet (100-pound base)	$9.75
Zinc strip (100-pound base)	$8.75
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	29.00
Copper	31.25
RODS	
Yellow brass (high, full turnings)	21.87½
Naval brass	23.87½
WIRE	
Copper	21.87½
Yellow brass (high)	23.50

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	12.50 to 13.00
Chicago	13.75 to 14.25
Cleveland	14.25 to 14.50
HEAVY YELLOW BRASS	
Cleveland	10.25 to 10.50
ZINC	
New York	3.50
Cleveland	3.00 to 3.50
HEAVY COPPER AND WIRE	
New York	15.50 to 15.75
Boston	16.25 to 16.50
Chicago	16.00 to 16.50
Cleveland	16.25 to 16.50
RED BRASS BORINGS	
New York	11.50 to 11.75
YELLOW BRASS TUBING	
Cleveland	10.75 to 11.00
LIGHT COPPER	
New York	13.25 to 13.50
Chicago	13.75 to 14.25
Cleveland	14.75 to 15.00
LIGHT BRASS	
Boston	8.25 to 8.50
Chicago	9.50 to 10.00
Cleveland	8.50 to 9.00
ALUMINUM	
Clippings, Cleveland	18.00 to 18.50
Borings, Cleveland	9.00 to 9.50
Cast, Cleveland	12.75 to 13.00
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	17.00 to 17.50
Brass ingot, 85-5-5-5	18.00 to 18.50

Coke By-Products

Sulphate of Ammonia in Better Market—Toluol Supply Still Falls Short

New York, March 12.—Although far from brisk, inquiry for sulphate of ammonia is somewhat improved and there is slightly more buoyancy to the market. While $2.30 may still be done in some quarters on material for spot shipment for domestic account, business has been booked recently at $2.35, delivered. Export inquiry also is slightly better and, in some instances, $2.25, port, has been quoted. Prices on light oil distillates are unchanged and toluol is scarce.

Coke Oven By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure benzol	$0.23
90 per cent benzol	0.23
Toluol (nominal)	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.30

Quicksilver Is Steady

New York, March 12.—Quicksilver is quiet and steady at $123 to $124 a flask.

Warehouse

Buying Sustained in Most Sections—Increases in West—Falls Off in East—Price Trend Upward—St. Louis Sheets Up

SPRING demands for various forms of steel utilized in outside work are commencing to show expansion, particularly in the West and South. A slowing up of buying is noted in the East but this is believed to be but temporary. Prices are firm with the trend upward. Sheets and rivets advanced at St. Louis and the latter product went up at Detroit.

New York—Trading is moderate and less brisk than a week ago. Jobbers generally regard this slowing up as temporary, in view of the approaching spring season and the well booked condition of the mills. Prices are unchanged.

Philadelphia—While jobbers report some reduction in business, prices are firm and unchanged.

Pittsburgh—Sales have expanded slightly since the first of March. Jobbers are benefitting to a certain extent from the inability of mills to make prompt shipments to consumers, particularly on certain grades of sheets. Prices show a firmer tone although all products are quotably unchanged.

Cleveland—March is holding true to form both in point of tonnage sold by jobbers and in numbers of orders handled, as one of the best months of the year. Sheet prices are unchanged and the movement has been accelerated by deliveries to tinshops. Bars and small shapes are particularly active to a diversified list of buyers.

Buffalo—Demand continues good, with further extension of mill delivery dates helping to stimulate warehouse business. Sheets and shapes have been especially good sellers recently although all lines are moving well in proportion to total sales.

Cincinnati—Prices in the warehouse market continue steady. A break in weather is expected to bring forward outside work and a resultant increase in business.

Detroit—Demand for warehouse iron and steel continues stronger than a year ago. Improvements in building situation as spring weather develops will be a helpful factor. Prices are strong but unchanged except in the case of rivets, which have been advanced $4 per ton, to 4.15c, for both boiler and structural grades.

St. Louis—Sales by warehouses have increased as highway construction work together with municipal improvements in the South have opened up. One pass cold rolled sheets were marked up to 4.25c and galvanized to 5.10c. Rivets were advanced $4 per ton. Prices throughout the entire list are firm with the trend upward.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York†††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.85c to 3.25c
Philadelphia	2.75c to 3.10c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Phila., 3/16-in.*	2.90c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.20c
San Farncisco	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore	3.25c to 4.00c
Boston	4.85c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.60c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.90c to 4.00c
Philadelphia*†	4.00c
Pittsburgh**	3.80c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.30c to 4.50c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.45c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York	4.75c
Philadelphia*†	4.75c
Pittsburgh**	4.55c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	5.10c
St. Paul	4.90c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit, ⅛-in. and lighter	3.30c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	3.75c
Philadelphia*	3.15c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York‡‡	4.25c
Philadelphia*	3.40c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore (c)	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.60c	4.10c
Philadelphia*	3.60c	4.00c
Pittsburgh	3.60c	4.10c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.25c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, rounds	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **25 or more sheets. *†50 or more bundles.

Pacific Coast

Buying on Better Basis as Spring Opens—Many Projects Pending

OIL country goods for Southern California form the largest item in pipe, though a number of smaller projects call for fair tonnages. Steel fabricators are busy with a large backlog. Demand for cast iron pipe has declined sharply from recent totals. Pacific Northwest is beginning to feel the usual spring activity. Prices on all products are unchanged.

Seattle, March 7.—Business in the Pacific Northwest is improving. Spring work is under way, Alaska activity is beginning and the agricultural sections are buying more freely. Wholesale houses report an increased turnover. The steel market remains firm. Recent orders accepted by local steel mills have been in small tonnages but the total volume is considerable.

Bars, Plates and Shapes

No large inquiries for plates have developed but jobbing houses report a satisfactory turnover in light gages for small construction jobs. Bids were opened by the United States reclamation bureau at Ellensburg this week for crossing of the Yakima river in connection with the Kittitas irrigation project. Thompson Bros., Los Angeles, were low bidders at $345,879 for construction of the 3200-foot tunnel under the river. For construction of the steel syphons alone the Commercial Boiler Works, Seattle, bidding $226,567, was low. The project involves about 1700 tons of plates. The proposals are under advisement by government engineers.

General Construction Co. was low at $376,190 for construction of the superstructure of the Spokane street, bridge, Seattle, involving 1505 tons of shapes and 170 tons of machinery. The award will be made shortly. For the proposed Medical-Dental building, at Tacoma, 1100 tons of shapes will be required. Plans for the Fourteenth avenue south bridge, Seattle, are being drawn by the Scherzer Rolling Lift Bridge Co., Chicago. Bids will likely be advertised in May. Northwest Contract Co., Portland, has the contract for constructing the state bridge over the McKenzie river in Oregon, involving 81 tons of shapes and 45 tons of reinforcing.

Finished Materials

Wholesale jobbers state that business is improving and spring buying is more active. Prices are being well maintained.

Several improvement jobs in Seattle, involving cast iron pipe, have been awarded but contractors have not yet closed for pipe. Paine & Gallucci were low bidders on a large water main job at Tacoma involving more than 2000 tons of cast iron pipe. Portland is in the market for 10,000 feet of 2-inch cast iron pipe for the water bureau.

The market is unchanged with local mills paying $10 and $11 gross for steel scrap. This material is arriving in larger volume. Foreign buyers are active at Coast centers but find it difficult to compete with mills at Seattle. Cast iron scrap continues scarce with the high level of $14.50 net ton being reported. Not much of this material is being sold as foundries consider the price out of line.

Coke Imports Increase

San Francisco, March 9.—(*By Air Mail*)—Foreign importations of iron and steel products on the Pacific coast for December, 1928, figures for which have just been received, were as follows, for the major items:

	Tons Dec. 1928	Tons Nov. 1928	Tons Dec. 1927	Tons Year 1928	Tons Year 1927
Coke	4,442	3,396	2,294	66,354	58,452
Cast iron pipe	2,991	4,691	2,277	29,822	37,563
Tubular products	3,846	4,217	1,182	35,888	39,167

Pig iron imports during December totaled less than 400 tons, while imports of bars were less than the total brought in during November, 1928.

Pig Iron and Coke

Foundry operations continue more or less limited and sales and inquiries for foundry iron and coke are confined to small tonnages.

Bars, Plates and Shapes

Awards of concrete bars this week totaled 2585 tons, the largest for the year, and brought the aggregate for the year to 15,687 tons, compared with 18,517 tons for the corresponding period in 1928. The 1500 tons for the Carquinez Straits bridge has been placed with an unnamed interest. An apartment in Los Angeles took 900 tons. Pending business exceeds 3200 tons, most of which is relatively small lots. No change in out-of-stock quotations is noted, 2.20c to 2.30c base continuing to apply on carload lots with as high as 2.60c on less.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

Structural steel fabricators are fairly busy and awards this week were the largest in the history of the Coast, and aggregated 23,657 tons, bringing the total for the year to 48,253 tons, compared with 33,952 tons for the corresponding period in 1928. In addition to the 22,000 tons for the Carquinez Straits bridge, 765 tons for an apartment in San Francisco was placed with the Judson-Pacific Co. The Golden Gate Iron Works obtained 200 tons for an apartment in Berkeley and the Consolidated Steel Corp. took 250 tons for a stage building for the Paramount-Famous Lasky Co., in Los Angeles. Bids were opened this week on 257 tons for a bridge at Ellensburg, Wash., and 105 tons for a bridge at Portland. Plain material continues unchanged at 2.35c c.i.f. Coast ports.

Other Finished Material

Demand for cast iron pipe has fallen off to some extent and pending business does not exceed 5000 tons. Awards this week aggregated 1484 tons and brought the total for the year to 22,672 tons, compared with 16,241 tons for the same period last year. The largest tonnages went to the American Cast Iron Pipe Co. and included 338 tons for Anaheim, Calif., 171 tons for Spokane, Wash., 250 tons for Vancouver, B. C., and 315 tons for the improvement of Browns Point boulevard, Tacoma, Wash. No action has yet been taken on the 2242-ton inquiry of the Southern Pacific Co., San Francisco. The only new inquiry of the week involved 494 tons for a street improvement project in South Gate, Calif. Oil country goods are moving well, especially in the southern part of California.

Cambria Mills Set Record

Johnstown, Pa., March 12.—Production records were broken by five mills at the Cambria plant of the Bethlehem Steel Co. during February, according to company officials. No data on the tonnage were released. The 9-inch No. 2 and the 13 and 14-inch mills of the Gautier works, and the 40-inch blooming and 34-inch billet mills, bettered their previous records.

Mill Superintendent Dies

S. L. McCormick, mill superintendent, Michigan Steel Corp., Detroit, died of heart failure March 11. He formerly was strip steel sales manager for the Trumbull Steel Co. and also had been identified with the West Leechburg Steel Co., West Leechburg, Pa., and the Morris & Bailey division of the Oliver Iron & Steel Co., Pittsburgh.

J. E. Wilson Is Dead

J. E. Wilson, 82, auditor at the South Chicago works of the Illinois Steel Co., Chicago, died March 11. He had been connected with that plant and the Joliet, Ill., works of the company for more than a half century.

Wheeling Annual Report Shows Good Year

Wheeling, W. Va., March 12.—Lower operating costs are described as the chief factor in improved profits of the Wheeling Steel Corp. for last year by Alexander Glass, chairman, in the annual report for 1928. Net profits for the year was $6,443,739, after depreciation, depletion, interest and taxes. This compares with $4,028,916 for 1927, and $5,006,460 for 1926.

Total sales for 1928 amounted to $78,073,001, an increase of less than 8 per cent over 1927 and a decrease of about 6 per cent from 1926. Total surplus after deduction of preferred dividends of $2,653,288 was $13,033,085, compared with a surplus of $11,040,063 at the beginning of last year. In addition to ordinary repairs and maintenance, expenditure during the year for betterments to property amounted to $9,922,092.

The report states it will be necessary to make additional expenditures to complete the present construction program of the corporation. The report also mentions that acquisition of the blast furnaces included in the Riverside plant of the National Tube Co., purchased from the latter, has eliminated the necessity for further operation of the Top furnace, and it has been abandoned. Plants of the Wheeling Can Co., formerly operated as a subsidiary in the manufacture of sanitary cans and other products of the canning industry, were sold during the year to the Continental Can Co. but profits from this transaction are not included in current earnings for the year. The consolidated balance sheet shows current assets of nearly six times current liabilities.

To Talk on Corrosion

Ulick R. Evans, lecturer in Cambridge university, England, will deliver a lecture at Columbia university, New York, Monday evening, March 18, on "The Corrosion of Metal and Its Industrial Significance." The lecture will be given in room 301, Physics laboratories building, 120th street, east of Broadway.

Lower Proposed Tariff

Toronto, Ont., March 12.—Few changes in the tariff law were proposed in the budget presented recently to the Canadian house at Ottawa by the Canadian minister of finance. Many lines of machinery for use in the mining and metallurgical industries are to be put on the free list. Reductions are recommended in the duty on printing presses, binding machines, equipment for generating power on farms, and agricultural implements. Debate on these suggestions is expected to develop some arguments for higher protection for the iron and steel industry.

Lectures on Corrosion and Its Prevention

Approximately 200 members and guests of the Cleveland Engineering society, and local branches of the American Society for Steel Treating, American Society of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers, attended a lecture presented by Dr. Ulick R. Evans, Cambridge university, Cambridge, England, on corrosion of metals, held at Cleveland, March 5.

Dr. Evans pointed out that thin adherent films of oxides prevented corrosion as long as the films were intact. However, it is difficult to obtain continuous films that will withstand corrosive action. Corrosion may be prevented in some cases by use of inhibitors such as sodium or potassium chromate or sodium phosphate placed in the water or painted on. Alloy steels and iron of the stainless type are effective, but do not withstand all corrosive media. Other methods used are deposition of another metal upon steel or iron, and painting.

Reading Iron Co. Shuns Price Cutters

The Reading Iron Co., Reading, Pa., has announced that as of March 1 it adopted a policy of refusing to make further sales of its puddled wrought iron pipe to any distributor who failed to observe the minimum resale prices suggested by the company. Price-cutting, according to the Reading company, "disorganizes and demoralizes the business not only of the manufacturer but also of the latter's other distributors." A recent decision of the United States supreme court states that a manufacturer "may withhold his goods from those who will not sell them at the prices which he fixes for their resale."

Algoma Breaks Record

Toronto, Ont., March 12.—The Algoma Steel Corp., Sault Ste. Marie, Ont., broke all production records in February. It is now working double turn. Output of alloy steel showed practically a 100 per cent increase.

Otis Steel Gains by Plant Betterment

Plant production and profits of Otis Steel Co., Cleveland, in 1928 reached the highest level in the peace-time history of the company. Net profits for the year, after all charges, including federal taxes, amounted to $3,370,982. This compares with $1,382,879 in 1927, a gain of 143 per cent. Plant operations averaged 90.5 per cent of capacity, against 80.4 per cent in 1927.

Net was equal to $3.15 a share on the 807,002 shares of common stock outstanding, compared with $0.75 a share on 741,802 shares one year ago.

Net current assets increased $1,343,062. In 1928 the company increased its item of depreciation to $864,000, compared with $720,000 in 1927. Shipments of all major products in 1928 were 703,000 tons, against 587,071 tons in 1927.

Through rearrangement of equipment and greater efficiency, finished steel capacity has increased approximately 55 per cent since 1924. Sheet capacity has increased 125 per cent and hot and cold strip capacity is up nearly 400 per cent. Capital expenditures of $2,417,199 compares with $1,157,446, the average for the three years ended Dec. 31, 1927.

Start New England Pipe Plant Shortly

New York, March 12.—That construction on the proposed $3,000,000 cast pipe plant of the newly-organized Intercontinental Pipe & Mining Co. at Chelsea, Mass., would begin within 60 days was announced recently by the industrial development department of the Boston & Maine railroad. The plant will be erected on a 35-acre site on the lines of the Boston & Maine railroad and, it is said, should be producing pipe this fall. As noted in a previous issue, the Chelsea plant will have an annual capacity of 150,000 tons. It will employ 500 to 600 persons, it is said.

The Intercontinental Pipe & Mining Co. was organized by the Pont-a-Mousson interests, of France, less than a month ago, with Marcel Paul, of France, chairman, and Herbert Kennedy, of Herbert Kennedy & Co., New York, American representatives of Pont-a-Mousson, president. Headquarters of the new company are at 475 Fifth avenue, New York.

The deepest metal mine in Europe is the Anna shaft at Pribram, Czechosolvaki, 4335 feet; four other mines in that district are more than 3640 feet deep each.

Begin Arbitrating Tutein-Hudson Valley Case

New York, March 12.—After many delays, hearings in the arbitration proceedings between E. Arthur Tutein Inc., Boston, and the Hudson Valley Coke & Products Corp., Troy, N. Y., were to begin tomorrow at the headquarters of the Bar association, 42 West Forty-fourth street, New York. The case involves an alleged breach of contract over the sale of pig iron and coke.

The difficulty in getting an umpire who would serve in this case was solved by the appointment of Louis K. Comstock, New York engineer, the appointment of Mr. Comstock having been made by Charles M. Schwab in the latter's capacity as president of the American Iron and Steel institute. The other two arbitrators are Judge Sherman L. Whipple, Boston, and Senator Robert F. Wagner, New York. The present plan is to hold hearings each day, including Saturdays, until the case is terminated.

Pittsburgh Near Capacity

Pittsburgh, March 12.—Steelmaking operations in the Pittsburgh district are maintaining at 90 per cent, although open-hearth operations at most mills are practically at capacity. Bessemer production, however, is on a lower plane. Schedules of finishing mills are little changed, with strip mills at capacity and sheet production at 95 per cent. Tin plate is at 85 per cent. Seamless pipe production holds at about 80 per cent, with welded pipe on a 60 per cent basis. Most bar mills are close to capacity.

Trackwork Shipments Up

Shipments of trackwork for tee rail track of 60 pounds per yard and heavier in February totaled 11,795 net tons, compared with 9996 tons in January and 11,371 tons last February, according to the American Iron and Steel institute, New York. February shipments were the heaviest for any month since last July. The total for the first two months of 1929 is slightly ahead of the comparable period of 1928.

Send Steel Down River

Pittsburgh, March 12.—Carnegie Steel Co. sent its fortieth tow of steel products and the second tow of the season to New Orleans March 8. The steamer CITY OF PITTSBURGH of the Carnegie line of steamers, with Capt. Calvin Blazier in charge, left the Pittsburgh harbor with a tow of 12 barges loaded with steel products from the various plants in the Monongahela valley and three barges of fuel consigned to New Orleans and intermediate ports.

Locomotives Still Off

Washington, March 12.—Shipments of electric industrial locomotives in February equalled January, according to department of commerce statistics. February unfilled orders gained over January. Monthly comparisons follow:

Year and Month	Shipments Total	Shipments Domestic Steam	Shipments Domestic Electric	Unfilled orders Total	Unfilled orders Domestic Steam	Unfilled orders Domestic Electric
1928						
Jan.	47	22	23	222	161	38
Feb.	59	43	11	204	146	40
Total (2 mos.)	106	65	34	426	307	78
March	70	44	15	178	123	37
April	46	38	6	188	129	41
May	41	29	10	220	138	39
June	51	39	11	201	109	37
July	46	19	5	198	98	59
Aug.	34	23	4	204	135	26
Sept.	41	28	2	178	118	27
Nov.	35	20	1	152	104	31
Dec.	44	36	4	282	238	27
(1928)	550	367	92	.....	.....	.....
1929						
Jan.	23	6	6	278	251	21
Feb.	23	20	1	339	301	20
Total (2 mos.)	46	26	7	517	552	42

Galvanized Ware Gains

Washington, March 12.—January production of galvanized sheet metal ware increased over December and was higher than in January, 1928, according to the department of commerce. Monthly comparisons follow:

	PAILS, TUBS, (In dozens)		OTHER WARE	
	Production	Shipments	Production	Shipments
1928				
Jan.	125,536	149,304	32,678	35,689
Feb.	165,757	162,153	28,513	26,334
March	173,592	175,472	50,904	45,205
April	208,544	201,119	31,545	36,452
May	177,170	155,561	39,206	35,143
June	141,448	144,385	48,038	44,833
July	114,343	121,415	61,688	47,856
Aug.	127,797	142,487	37,846	44,377
Sept.	150,845	139,183	55,850	50,606
Oct.	153,813	152,258	56,469	54,596
Nov.	131,792	103,290	33,553	34,012
Dec.	112,923	102,802	36,042	23,567
Total	1,795,625	1,763,401	515,428	481,421
1929				
Jan.	151,106	165,745	40,649	36,896

Becomes Norton Engineer

Andrew B. Holmstrom has resigned as superintendent of sewers for Worcester, Mass., to become supervising engineer at the new mill unit being constructed by the Norton Co., Worcester, Mass., at its wheel division. Mr. Holmstrom will assume his duties April 1.

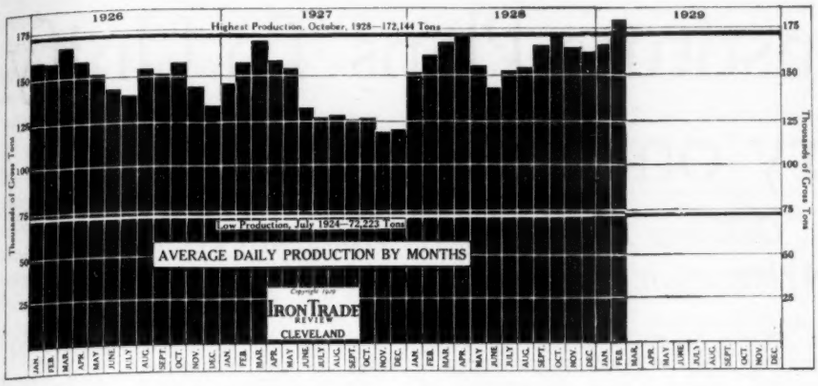
Youngstown Steady Save Slight Tube Decline

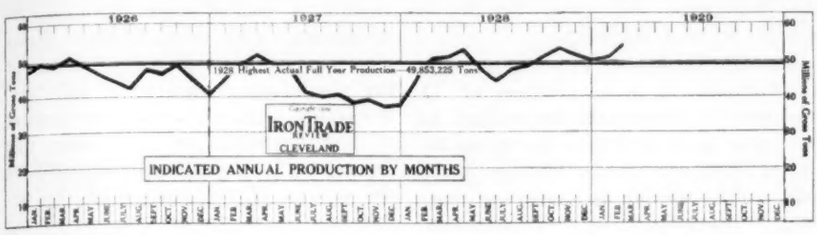
Youngstown, O., March 12.—Steel mills here continue to maintain their high rate of operations this week, unchanged from last week with the sole exception of tubular mills, which show a slight recession. Strong demand for semifinished steel, which has been a feature of the trade for some weeks, is keeping active every possible independent open hearth, 49 melting this week out of a total of 51 units, or 96 per cent, same as last week. Bessemer output also is unchanged. Steel corporation subsidiaries have all available open hearths active and their general works operations at 80 to 85 per cent.

Independent steel bar operations are at 75 per cent, and Carnegie Steel Co. at 85 per cent. Sheet mill activities with the independents are at practical maximum, with 123 units active out of 125, a gain of one over last week, or at 98 per cent. Tin and strip mill operations are at capacity as in past weeks with independents, and 85 per cent for Steel corporation subsidiaries. Nine pipe welding units are active this week, out of a total of 20 welded and seamless units, against 11 last week. The Byers puddle and skelp mills at Girard, O., all are operating this week.

Three Outboard Engine Companies Merge

Announcement is made of the consolidation of the Evinrude Motor Co., Milwaukee; Elto Outboard Motor Co., Milwaukee, and the Lockwood Motor Co., Jackson, Mich., into a new corporation known as the Outboard Motors Corp., Milwaukee, with assets of $4,000,000. The new company will have 120,000 shares of no-par convertible preferred, all to be issued, and 300,000 no-par common shares, of which 160,000 is to be outstanding. The three plants will be operated separately for the time being. Officers of the new company are: Chairman, Stephen F. Briggs, president, Briggs & Stratton Corp., Milwaukee; president, Ole Evinrude, president, Elto Co.; vice presidents, Charles L. Coughlin, president, Evinrude Co., and Jacob Stern, assistant general manager of Elto; secretary, John L. Brown, of J. D. Currie & Co., Detroit; treasurer, Arthur Lockwood, president of the Lockwood Co. These and Sheldon R. Noble, of H. W. Noble & Co., Detroit, constitute the board of directors. Production for 1929 will be approximately 40,000 engines.





February Ingots at New Peak

STEEL ingot production in February not only reached a new high record for that month but also a record for all time. At 180,198 gross tons daily, open hearth and bessemer steel plants easily topped the previous high mark for February—the 161,812 tons of a year ago—and swept 5 per cent past the all-time figure of 172,144 tons recorded in October, 1928.

According to the compilation of the American Iron and Steel institute, which is based on reports from companies which accounted for 94.68 per cent of the 1927 output, the open hearth and bessemer steel industry was operating in February at 95.59 per cent of capacity, contrasted with 88.20 per cent in January and 85.84 per cent last February.

At the rate steel was being made in February, the 1929 total would slightly exceed 55,000,000 tons, compared with the record 49,857,223 tons of 1928.

In the first two months steel ingot production has averaged 172,826 tons daily, also a record. On account of the short month, February having only 24 working days or three fewer than January, the month's ingot total was 4,324,759 tons. This compares with 4,489,391 tons in January and 4,045,304 tons last February.

Thus far in 1929 tonnage of open hearth and bessemer steel is 8,814,150 tons, against 8,036,636 tons in the comparable period of 1928.

Steel Ingot Production—1928-1929

94.68 Per Cent of Industry Reporting

Gross Tons

	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
1928							
Jan.	3,280,247	498,746	3,778,993	3,991,332	26	153,513	81.43
Feb.	3,308,728	521,366	3,830,094	4,045,304	25	161,812	85.84
2 mos.	6,588,975	1,020,112	7,609,087	8,036,636	51	157,581	83.59
March	3,700,411	567,309	4,267,720	4,507,520	27	166,945	88.56
April	3,509,637	564,039	4,073,676	4,302,573	25	172,103	91.29
May	3,397,631	581,949	3,979,580	4,203,190	27	155,674	82.58
June	3,016,487	527,351	3,543,838	3,742,964	26	143,960	76.37
July	3,075,247	533,550	3,608,797	3,811,573	25	152,463	80.88
Aug.	3,386,750	569,436	3,956,186	4,178,481	27	154,759	82.09
Sept.	3,381,917	545,015	3,926,932	4,147,583	25	165,903	88.01
Oct.	3,802,396	598,227	4,400,623	4,647,891	27	172,144	91.32
Nov.	3,441,985	590,796	4,032,781	4,259,380	26	163,822	86.90
Dec.	3,308,872*	496,726*	3,805,598*	4,019,432*	25	160,777*	85.29*
Total	40,610,308*	6,594,510*	47,204,818*	49,857,223*	311	160,313*	85.04*
*Revised							
1929							
Jan.	3,700,939	549,616	4,250,555	4,489,391	27	166,274	88.20
Feb.	3,605,403	489,279	4,094,682	4,324,759	24	180,198	95.59
2 mos.	7,306,342	1,038,895	8,345,237	8,814,150	51	172,826	91.68

Figures exclude crucible and electric ingots. Operation percentages for 1928 and 1929 are based on an annual open-hearth and bessemer steel ingot capacity of 58,627,910 tons as of Dec. 31, 1927.

Furniture Orders at New High Record

Washington, March 12.—Steel furniture orders in January surpassed the record month of December, according to the department of commerce. Orders in January were $3,905,906, compared with $3,610,645 in December. Following are comparisons by months:

	Business Group Orders received	Business Group Shipments	Shelving Orders received	Shelving Shipments
	(In Dollars)			
1927				
Total	30,760,343	31,105,789	7,351,122	7,264,282
1928				
Jan.	3,248,165	2,712,663	768,748	680,264
Feb.	3,295,861	2,908,527	741,310	681,999
March	3,283,329	3,169,351	841,098	813,607
April	2,915,344	3,065,637	740,658	716,104
May	3,085,638	3,213,291	732,921	768,988
June	2,764,085	3,009,229	727,060	720,253
July	2,594,216	2,515,482	713,330	722,516
Aug.	2,619,234	2,564,638	863,422	836,105
Sept.	2,689,009	2,754,135	799,850	678,422
Oct.	3,192,927	3,158,998	958,726	953,804
Nov.	2,675,664	2,854,312	875,354	915,640
Dec.	3,610,645	3,117,139	828,555	791,376
Total	35,974,117	35,043,412	9,601,032	9,297,078
1929				
Jan.	3,905,906	3,625,533	1,099,039	970,798

Steel Plate Orders Low

Washington, March 12.—Steel plate orders of January decreased from December and also from January, 1927, department of commerce figures show. Following are monthly comparisons:

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1928					
Jan.	35,787	8,758	2,062	1,225	16,412
Feb.	49,820	25,532	3,679	143	15,420
March	46,840	25,226	1,897	699	14,683
April	50,347	22,095	4,654	619	16,265
May	42,487	14,852	4,744	202	17,768
June	35,202	12,204	3,225	778	15,803
July	35,959	16,881	1,848	499	12,159
Aug.	47,245	24,807	1,814	429	17,579
Sept.	40,281	18,572	1,642	386	13,976
Oct.	53,983	23,960	1,861	2,435	17,480
Nov.	54,277	32,381	2,081	563	10,731
Dec.	36,254	14,217	2,216	655	12,060
(Year)	528,482	241,828	31,723	8,633	181,336
1929					
Jan.	32,724	11,055	2,018	325	11,567

Peoria Needs Workers

With the increase in several lines of industrial operation in Peoria, Ill., between 3500 and 5000 factory employes will be needed soon, according to advices sent out to other cities. The need particularly is for machinists, pattern makers, tool makers and high grade factory help.

The usableness of chromite as a refractory depends in part upon the physical structure. The most important requirement is the ratio of the chromium and alumina content to the iron and silica tenor.

New Scrap Institute Plans To Unify Industry on Better Basis

First Annual Convention Outlines Program for Betterment Along Many Lines—Code of Ethics, Arbitration, Insurance and Costs Are Considered

PROGRESS in organizing the iron and steel scrap industry in a way to benefit its members and raise its standards was made apparent in the proceedings of the first annual convention of the newly-organized Institute of Scrap Iron and Steel, held at the Hotel Pennsylvania, New York, March 7.

Most important of the actions taken was a resolution whereby the institute makes application for a hearing before the federal trade commission to which the entire scrap trade of the country is to be invited. The purpose of this hearing is to expose unfair practices in the scrap business and to formulate a code of ethics. William E. Humphrey, chairman of the federal trade commission, who spoke at the banquet, assured the gathering that this application would be accepted and that the hearing would be scheduled as soon after May 1 as possible.

A resolution was adopted providing for compulsory arbitration of all disputes between members of this institute. This resolution called forth much discussion. At first there was a feeling that arbitration was a good thing, but that making it compulsory might be too drastic. There was some talk about allowing members voluntarily to resort to arbitration, or making arbitration compulsory only in disputes where the amount involved was less than $500.

At this point remarks by Harry Ehrlich, Hartford, Conn., had a clarifying effect. Mr. Ehrlich was in favor of having full confidence in the new institute and in its ability to settle fairly the disputes between its members, and he was heartily opposed to any half-hearted measures. The vote by which compulsory arbitration was adopted was unanimous. It was disclosed that the institute's arbitration facilities already have been employed in satisfactory adjudication of a number of business disputes. It was learned that the institute already has a list of more than 20 leading men in the scrap industry who have been approved as qualified to serve as arbitrators.

Under the plan, three arbitrators are to decide each case. One arbitrator is named by each of the two contestants, and the third by the institute, and the award is final and binding on the disputants. All cases are to be handled without publicity.

Another resolution provided for the appointment of a committee of 11 members to investigate the subject of insurance as applying to the scrap industry, and report whether the institute shall organize an insurance company to carry the risks of its members. It was pointed out that insurance rates in some states are much higher than in others, and that generally the matter of insurance is a burden to scrap dealers. The head of one large scrap firm which has a number of branch offices told about a plan which enables the company to save about 75 per cent of the regular cost of insurance, and he believed that an insurance company conducted by the institute would result in great savings. There was much sentiment in favor of the creation of such an insurance company, but it was felt that the matter should be thoroughly investigated. From the general tenor of the remarks, however, it appears likely that the next meeting of the institute will see favorable action with respect to having the scrap industry carry its own insurance.

Another action was the decision to appoint a conservation committee to co-operate with the United States government in the conservation of the diminishing supply of iron ore. Benjamin Schwartz, director-general of the institute, in proposing this resolution, alluded particularly to the ability of the steel mills, by using more iron ore in relation to pig iron output, to stay out of the scrap market at will. In addition to working a hardship on dealers, he contended, this practice results in premature depletion of iron ore resources.

The subject of costs and the manner in which losses recently have been taken by many scrap dealers was the subject of considerable thought. Mr. Schwartz suggested the appointment of a committee to study the cost of doing scrap business. This resolution was carried and members of the institute will be advised of the findings of this committee. Mr. Schwartz also called attention to the fact that there is much competition which is harmful to the business as a whole. He mentioned a case of several completely equipped yards in one locality, and not enough business to keep them all busy. The result is a bad operating showing for each yard. He recommended that in such cases dealers merge their yards, pointing out the successful results which have been brought about in other industries by mergers which eliminated destructive competition.

Carlisle H. Strand, of the iron and steel division of the United States tariff commission, analyzed consumption of scrap in the United States. Mr. Strand estimated that approximately 34,000,000 tons of steel scrap was used last year.

Relations between scrap dealers and consumers were the subject of remarks by the director general, who as will be seen in the following article, outlined a basis for co-operation.

Joseph G. Hitner, president of the institute, reported 11 chapters, and that from 18 comprising the membership last August the number of members had grown to 310. By the or-

Scrap Dealers Outline Strong Program

Action by the Institute of Scrap Iron and Steel at its first annual convention included:

Asked federal trade commission for hearing to formulate code of ethics.

Passed resolution calling for compulsory arbitration of disputes between members.

Ordered investigation of advantages of the industry carrying its own insurance.

Acted to aid conservation of iron ore reserves.

Appointed committee to investigate costs of doing business and advantages of mergers as economy.

ganization of the institute, he said, competitors have been brought together who formerly scarcely knew each other. Frank B. Parker, of Briggs & Turivas, Chicago, who presided at the morning session, reported for the Chicago chapter; David Pollock, Pottstown, Pa., who presided over the afternoon session, for the Reading chapter; Charles Bock, Buffalo, who acted as toastmaster at the banquet, for the western New York chapter; George B. Doane for the Boston chapter; Michael V. Bonomo for the New Jersey chapter; Nathan Katz for the southern New England chapter; Morris Speer for the Cleveland-Detroit chapter; H. N. Trimble for the Pittsburgh chapter; John R. Briggs for the Philadelphia chapter; Charles Pfeiffer for the New York chapter, and R. W. Kolkmeyer for the Cincinnati chapter.

It was announced that more than 7000 inches of space in business papers had been occupied by news stories in relation to the institute's activies since last August. A resolution thanking the business papers for their assistance and interest was carried. It was reported that the institute's traffic bureau, which provides information about freight rates and all phases of traffic, had effected material savings to members by auditing their freight bills, savings which had more than paid the membership dues. The legal bureau of the institute is rendering service to an increasing number of members. The convention also voted to appoint an advisory committee, to consist of the officers of the institute and the officers of the chapters, and to organize a specifications committee. It was reported that as a result of the growth in activities of the institute, headquarters were being moved to larger quarters and the institute is now located at 11 West Forty-second street, New York.

Judge Moses H. Grossman, honorary president of the American Arbitration association, was a speaker at the banquet. The attendance at the convention included 205 of the 310 members of the institute.

Program Outlined for Removing Scrap Abuses

BENJAMIN SCHWARTZ, director-general of the Institute of Scrap Iron and Steel, to whose activity much of the success of the organization in its first year can be attributed, presented a program of activities for the organization in his address, which is in part as follows:

Having reached a stage of organization where we can begin devoting ourselves to constructive work, and having seen the dealers throughout the country gather with a willingness to face facts, I wish to make certain recommendations with reference to (a) The relations of dealers with consumers of scrap; (b) Relations of dealers among themselves; (c) The internal organization of the institute.

The whole problem of the relations of dealers with mills has been confused by misunderstanding, suspicion, fear, lack of confidence and the absence of a responsible organization to represent the dealers. It is hoped that the program of the institute for the setting up of a code of business practice with the co-operation of the federal trade commission, and backed up by a strong organization, will restore these elements which have been lacking.

Says Middleman Is Necessary

There is no industry in America where the middleman is so necessary as in the scrap industry. Nevertheless, although the consumers of scrap have a tremendous respect for the commodity, they fail to show the same consideration for the man who supplies that commodity. While the scrap iron dealers, through their application for a conference with the federal trade commission, may admit that certain abuses that have inevitably arisen out of chaos and undisciplined competition, are unfair, at the same time it is a question in my mind whether the mills are entirely blameless.

I say that there must be some middle ground on which both groups can meet. The mills must learn that the scrap dealer is entitled to a fair return for his service, otherwise there is no incentive to gather the scrap. It is my conviction that the mills will learn, if they haven't already, that they cannot compete with the dealer for scrap at the same sources and still expect the dealer, with expensive equipment compelled to be idle, to render that service in emergencies and throughout the year, which they have demanded, and will expect.

The dealer on the other hand must learn that the foundation for his business is service to the mill and profit for himself, and that the continuation of the old methods of doing business mean losses and injury to the consumer. Both must learn that the interests of mill and dealer are identical. Out of this understanding between the two groups must come recognition, equality of discussion and adjustment of difficulties.

The next few months should see the calling of a conference by the federal trade commission of the entire scrap iron industry. This conference, known as a trade practice conference, will be asked to declare to the federal trade commission what, in the industry's opinion, is considered unfair practice and unfair competition. This is the most important step ever taken in the history of the scrap iron business. The ultimate effect of this action is expected to set the house of the scrap iron industry in order, put teeth in any rules or code of practices adopted by the industry and vitally affect the relations of scrap iron dealers with the steel mills. In former years it was not unusual for the government to step in and compel industries to substitute co-operation and order, for the law of the jungle. The federal trade commission stands ready, through its machinery, to aid trade associations to voluntarily prescribe rules of fair play and sound practice.

Another constructive step to be taken by the institute during the coming year is to begin its educational campaign among the members on the cost of doing business. It ought to be evident that the opportunity to make profits from speculation in scrap, has long since passed. It ought to be recognized by the intelligent business man that the only way to make consistent profits, with competition as it is today, is to look to his buying and to figure his costs.

It is therefore recommended that a committee of costs and statistics be appointed, to map out a survey, gather statistics and place the same at the disposal of the chapters and the individual members.

I want to call attention to a movement which in the course of time will solve many of the problems of unfair competition in this industry. With co-operation and mergers on all sides, to meet the new demands of competition, it would seem advisable to encourage mergers between firms in this business, which have a community of interest. Mergers offer no cure-all for all industrial problems, but they do have the effect of increasing service for customers, reducing waste and eliminating cut-throat competition.

Would Effect Mergers

In many cities one will find scrap yards adjacent to each other, competing for the same business with profits for none. In one city I find as many as five yards within a short radius, each of which has equipment that is idle, in each of which the overhead continues regularly. In such cases, it would seem that intelligent discussion of the possibilities of merger may result in capacity productions of scrap, ability to deliver large tonnages and some profit, due to the reduction of appreciable overhead.

This is a matter which I submit without recommendation at this time, in the hope that the business men, in whose intelligence we can place reliance, will find it advisable to think of their own problems, as business men in other industries have done.

C. F. Kettering, vice president and director, General Motors Corp., Detroit, will be the principal speaker at a meeting of the Detroit chapter, American Society for Steel Treating to be held at Hotel Fort Shelby, March 18. "The Relation of Metallurgist to Management" is the topic.

Industrial Men in the Day's News

George Eaton Scott, New President, American Steel Foundries, Chicago

AS NEXT in line he was the natural selection of his board to fill the vacancy when Robert P. Lamont last week became United States secretary of commerce.

FROM an obscure position with a hardware company in St. Louis, he has risen to be head of one of the most important steel foundry interests of the country.

DRAFTED to serve in the American Red Cross during the war, he since has done humanitarian service whenever called.

GEORGE E. SCOTT, senior vice president of the American Steel Foundries, Chicago, has been chosen the successor to Robert P. Lamont as president of that company. The latter, as noted on page 684 of IRON TRADE REVIEW of March 7, resigned to accept his appointment by President Hoover as United States secretary of commerce.

Mr. Scott was born in St. Louis and started his business career with the Simmons Hardware Co., that city. About 28 years ago (in 1901) he located in Chicago, being elected vice president of the Simplex Railway Appliance Co., which later was acquired by the American Steel Foundries. Four years later he was elected vice president and later became its senior vice president.

During the World war Mr. Scott was drafted by Henry P. Davison, chairman of the American Red Cross. He was granted leave of absence and served faithfully in that organization from May, 1917, until April, 1919, initially as general manager at Washington and then as member of the war council. In April, 1919, he returned to his official duties at Chicago and that year was unanimously elected to the executive committee of the Red Cross, on which body he has continued to serve ever since. In the spring of 1927 he again was called to Washington to take charge of the national relief headquarters of the Red Cross during the Mississippi river valley flood disaster.

While his outside interests are not numerous, he is a director of the Harris Trust & Savings bank, the H. Channon Co., and Griffin Wheel Co., all of Chicago.

The pressure of his numerous duties leaves him little time for recreation but this chiefly is obtained in the pursuit of his hobbies—fishing and hunting—to which he is passionately devoted. He always has taken a keen interest in the Isaak Walton League of America and is now a national director of that league. He served for some time as chairman of its executive committee.

Mr. Scott is a member of the following clubs: Chicago, Old Elm, Onwentsia, Shoreacres, Racquet and Tennis, Commercial, Industrial and Mid-Day, all of Chicago.

J. L. SUSSMAN, president of Steel & Tubes Inc. of New York, Brooklyn, N. Y., subsidiary of Repblic Iron & Steel Co., Youngstown, O., has resigned effective April 1, and will spend several months traveling abroad principally in Europe. Mr. Sussman founded this company 20 years ago as the Mohegan Tube Co. and built up the company from a small beginning to its present large operations. A subsidiary company known as the Pontiac Tube Products Co. was formed in 1926. In 1927 the Mohegan and Pontiac companies were merged with Steel & Tubes Inc. of Cleveland and Elyria, O., with the former companies operating as Steel & Tubes Inc. of New York.

Morgan Ellis, manager of conduit sales of Steel & Tubes Inc., Cleveland, and who continues in that capacity, has been transferred to Brooklyn, N. Y., as vice president and general manager of Steel & Tubes Inc. of New York.

* * *

James S. Watson, with headquarters at the company's Dodge works, Indianapolis, has been elected vice

president of the Link-Belt Co., Chicago. For the past nine years he has been located at Indianapolis as general manager in charge of silent and roller chain production. He was born in Philadelphia and has been with the company continuously for 34 years, having originally entered its employ at the Philadelphia plant. In January, 1903, after eight years' experience in various departments, the company management selected him to exploit silent chain as a power transmitting medium.

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Aaron L. Mercer, Rockford, Ill., has been elected president of the Vulcan Corp., Portsmouth, O., C. E. Dowling, has been elected secretary, and H. S. Van Camp, Cincinnati, treasurer.

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Roger Prosser, manager of the widia department of Thos. Prosser & Son, 15 Gold street, New York, is leaving this week for Germany to confer with officials of the Krupp Works. He expects to be away six weeks.

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L. Dale Hagenbook, plant engineer for the Ross Gear & Tool Co., Lafayette, Ind., resigned recently to become assistant chief engineer with the Northwest Engineering Co., Green Bay, Wis., manufacturer of gas powered excavation machinery.

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Frank C. Farrell, who some time ago resigned as Youngstown, O., district manager for the Youngstown Sheet & Tube Co., is to become affiliated with Steel & Tubes Inc., Cleveland, division of the Republic Iron & Steel Co., Youngstown, O.

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O. J. A'Hearn, formerly in charge of the open-hearth furnaces, Central Alloy Steel Co., Massillon, O., has been appointed superintendent of the open-hearth furnace department of the Pittsburgh Crucible Steel Co. plant at Midland, Pa. He succeeds David G. Baxter, resigned.

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E. E. Springer, who has been sales manager for Reeves Bros., Birmingham, Ala., plate fabricators, was recently made eastern manager of sales, with headquarters in New York. R. R. Orwig, vice president of the company, is now also sales manager at Birmingham.

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Fred D. Baker has become associated with Charles H. Besley & Co., Chicago, manufacturer of grinding machines and equipment, as sales engineer, to represent the company at Buffalo, Erie, Pa., and Cleveland. Mr. Baker formerly was with the Strong, Carlisle & Hammond Co., Cleveland.

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B. W. Norton has been made assistant superintendent of the Haselton blast furnaces of the Republic Iron & Steel Co., Youngstown, O. He succeeds Chandler Markell, who as noted in IRON TRADE REVIEW of March 7, has been appointed superintendent.

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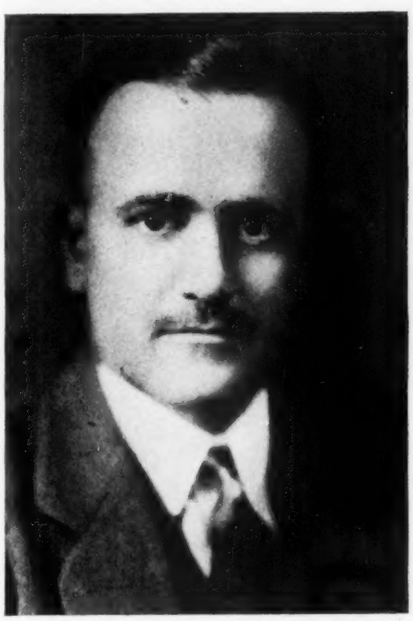
James M. Morton, formerly foundry superintendent, A. G. Spaulding & Co., Springfield, Mass., and who later made castings for paper and mill machinery at Saratoga Springs, N. Y., has been appointed treasurer of the



FREDERICK S. BLACKALL JR.

C. & M. Metal Products Corp., Springfield, Mass., manufacturer of pressed metal parts.

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Capt. M. F. Behar has been appointed advertising manager of the Quigley Furnace Specialties Co. Inc., 26 Cortlandt street, New York. He has been advertising manager for C. J. Tagliabue Mfg. Co. since 1924. He is a mechanical engineer, an inventor, etc., and has contributed articles to technical magazines, engineering handbooks, etc.

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Charles Leslie Bransford has been appointed general sunperintendent of furnaces and coke plant of the Republic Iron & Steel Co., Thomas division, southern properties, at Birmingham, Ala. W. E. Curran has been named coke plant superintendent and assistant to the general superintendent of furnaces. Mr. Bransford was a chemist for the Tennessee Coal, Iron & Railroad Co. beginning in 1905. In 1916 he became affiliated with the Gulf States Steel Co. After more than three years he was made general superintendent of furnaces for the Woodward Iron Co., remaining two years he then went with Semet-Solvay Co. at Ashland, Ky., and Buffalo, returning to Birmingham from Buffalo after a nine year absence.

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R. H. Ripley, formerly second vice president of the American Steel Foundries, Chicago, has been elected senior vice president to succeed George E. Scott, now president in the stead of Robert P. Lamont.

Thomas Drevor, president of the Wahl Co., Chicago, was elected secretary and treasurer and also to the directorate.

James F. Curtiss has resigned as director and Chauncey Belknap has been elected to fill the vacancy.

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W. C. Robbins, formerly chief engineer of the Hopdain Engineering Co., Buffalo, has been appointed chief engineer and works manager of the Gabriel Snubber Co., Cleveland. At one time he served as engineer for the Stephens-Duryea Co., Dayton, O., and during the war he was engaged in engineering and aviation at one of the Texas fields.

* * *

Daniel C. Eagan, formerly president of the Eagan Rogers Steel & Iron Co., Crum Lynne, Pa., has become associated with the Deemer Steel Casting Co., New Castle, Del. Since 1906 he has been secretary of the Shenango Machine Co., Sharon, Pa., treasurer of the General Casting Co., Pittsburgh, and president of the Keystone Steel Castings Co., Chester, Pa. Mr. Eagan will devote his time to manufacture and sales for the Deemer company in the production of carbon, manganese and alloy steel castings.

* * *

Willard S. Haring, who is general manager of sales of the Alan Wood Steel Co., Philadelphia, the successor of the Alan Wood Iron & Steel Co. and the Rainey-Wood Coke Co., is a native of Kansas, having been born near Topeka. His parents moved East, and his first position was as a clerk with the old Longmeal Iron Co., Conshohocken, Pa. In 1904 Mr. Haring became identified with the order department of the Alan Wood Iron & Steel Co., Philadelphia, later becoming manager of that section. He was then transferred to sales and four years ago was made general manager of sales of the Alan Wood Iron & Steel Co. under Charles O. Hadly, then vice president in charge of sales. Upon the recent resignation of Mr. Hadly when the merger of the Alan Wood Iron & Steel Co. and the Rainey-Wood

Coke Co. took place, Mr. Haring was reappointed general manager of sales, having full charge of the Alan Wood Steel Co.'s distribution. At present located in the Widener building, Philadelphia, Mr. Haring, after April 1, will have his headquarters at Ivy Rock, Pa., adjacent to the company's mills.

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Sterling W. Hubbard, one time Cleveland resident manager for Rogers, Brown & Co., has become affiliated with Otis & Co., Cleveland.

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Frank E. Birch has retired as vice president of the Northwestern Barb Wire Co., Sterling, Ill. He has held that office for five years.

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Guido G. Behn, advisory engineer for the Hudson Motor Car Co., Detroit, and connected with its engineering department since the company's early history has resigned.

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A. H. Beale, president of the A. M. Byers Co., Pittsburgh, has been elected a director of the Sharon Steel Hoop Co., Sharon, Pa., to succeed J. F. Byers, who has resigned.

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Maj. Jarvis J. Bain, Pittsburgh district engineer in charge of navigable rivers in that section, has been promoted to the rank of lieutenant colonel.

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W. L. Seelbach, secretary, Forest-City-Walworth Run Foundries Co., Cleveland, has been elected secretary of the American Plan association, Cleveland.

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Dr. L. H. Botkin recently was honored by the Carnegie Steel Co., Pittsburgh, when he was presented a silver service medal as a mark of distinction for 40 years' continuous service as company surgeon at Duquesne, Pa.

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H. G. Alexander was recently elected president of the National Screw & Mfg. Co., Cleveland, to succeed his father, the late W. D. B. Alexander, whose death was noted in the Jan. 31 issue of IRON TRADE REVIEW.

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E. J. Blair, who has been superintendent of the Lincoln Radiator Corp., Utica, N. Y., has been appointed to similar duties with the Utica Radiator Corp., that city, which has taken over the Lincoln plant.

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Capt. Holden C. Richardson, former chief of the design division of the bureau of aeronautics, United States navy department, has been elected vice president in charge of engineering and design of the Great Lakes Aircraft Corp., Cleveland.

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Alidor Lefere is president and general manager of the newly organized Lefere Forge Machine Co., Lansing, Mich. He was one of the organizers of the Riverside Forge & Machine Co., that city.

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Walter C. Voss has been appointed sales manager at Detroit for the Acklin Stamping Co., Toledo, O., with headquarters in the General Motors building. He succeeds Harold Jay, now with the Edward Ford Plate Glass Co., Detroit.

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John J. Findlater, identified with

DANIEL C. EAGAN

the open-hearth furnace and rolling mills departments of the Ford Motor Co., Detroit for almost 18 years and recently superintendent of those departments at the Fordson plant, has resigned.

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C. M. Tichenor, formerly vice president and general manager of the Universal Pressed Steel Co., Detroit, has been elected vice president in charge of production for the Charles Freshman Co. Inc., New York, radio manufacturer.

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Charles E. Diebold, formerly tool and machine supervisor in the shock absorber division of the National Acme Co., Cleveland, has been appointed sales engineer to specialize in the sale of the company's automatic machines.

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Fred L. A. Schmidt, industrial power plant specialist in the Cleveland district office of the General Electric Co. for the past 12 years, resigned March 1 to go on the power plant engineering staff of the H. K. Ferguson Co., Cleveland.

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H. A. Fisher and R. O. Gill, of Detroit, and K. W. Todd, Pittsburgh, have been elected directors of the Hayes Body Corp., Detroit, to represent eastern interests which have acquired substantial holdings in the company.

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Frederick S. Blackall Jr., was recently elected vice president and general manager of the Taft-Peirce Mfg. Co., Woonsocket, R. I., to succeed his father, the late Frederick S. Blackall. Upon the latter's death last October he succeeded him as general manager.

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George H. Weiler recently resigned as manager of sales of the general servicing department of the American Locomotive Co., New York, to become secretary-manager of the Forging Manufacturers' association, 5953 Grand Central Terminal building, New York, recently organized.

* * *

P. S. Jones, formerly manager of the Pittsburgh office of the Cutler-Hammer Inc. of Milwaukee, manufacturer of electric control apparatus, has been made manager of the company's New York district office. He succeeds C. W. Yerger, who resigned to become affiliated with Hanson-Van Winkle-Munning Co., Matawan, N. J., as noted in the Feb. 14 issue of IRON TRADE REVIEW.

T. S. Towle, formerly a sales engineer of the Pittsburgh office, succeeds Mr. Jones as manager there.

G. E. Hunt has been placed in charge of distributors' sales for the Cutler-Hammer company. He is widely known in eastern distributing circles, having been located in the company's Philadelphia office for the past 10 years.

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C. A. Barnett was recently elected president and O. D. Conover, vice president of the Foundry Equipment Co., Cleveland. Mr. Barnett has been associated with the Foundry Equipment Co. since July, 1916, and has been successively treasurer and vice president and general manager. Following his graduation from the University of Michigan in 1914 and prior to his association with the Foundry Equipment Co. he was employed by the National Carbon Co., Cleveland, where he specialized in electric furnace work.

Mr. Conover has been employed by the Austin Co. industrial engineer and

builder, for the past 10 years as assistant chief engineer. He has had considerable experience in foundry engineering and construction not only with the Austin Co. but also with the T. W. Price Engineering Co., New York, where he served in the capacity of chief engineer and vice president. Mr. Conover also has been production manager of the Electric Furnace Corp. and as chief engineer of the Bergen Point Iron Works.

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Frank Bement and Richard J. Le Blond have retired as directors of the Niles-Bement-Pond Co. The directorate of this company has been reduced from 14 to 12 members.

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B. W. Swayze Jr. has been appointed assistant purchasing agent of Bethlehem Fabricators Inc., Bethlehem, Pa., to succeed L. B. Jones, who recently resigned to become purchasing agent of the Bethlehem Construction Co., that city.

* * *

F. D. Taylor has resigned as secretary of Peck Stow & Wilcox Co., Southington, Conn., manufacturer of mechanics' tools. Mr. Taylor had been affiliated with the Southington company for approximately 20 years, serving first in the shops and later joining the sales staff.

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E. C. Sheldon of the Gilbert & Barker Mfg. Co., Springfield, Mass., has been elected president of the Industrial association. Other officers are: R. L. Brown, Westinghouse Electric & Mfg. Co., vice president; Charles Umla, Gilbert & Baker Mfg. Co., treasurer; Perley Stone, Gilbert & Baker Mfg. Co., assistant treasurer, and George E. Mayer, secretary.

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John A. Dwyer has been appointed purchasing agent of the Philadelphia & Reading Coal & Iron Co., with headquarters in the Reading Terminal building, Philadelphia. He succeeds E. L. Keane, retired. Mr. Dwyer for years had been assistant purchasing agent under Mr. Keane.

J. M. Conroy, formerly supervisor of materials and transportation for this company at Pottsville, Pa., has been appointed assistant purchasing agent, under Mr. Dwyer.

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Leslie H. Dodd, of Lawrence, Kans., who has served as chief engineer for several years for one of the largest construction companies in the West, designing and building large structures, has been added to the field staff of the American Institute of Steel Construction, New York. His headquarters will be at Dallas, Tex. His appointment gives the institute 11 district engineers under the supervision of F. H. Frankland, manager of technical service, New York.

* * *

T. J. Cornwell has been elected president of the Peerless Foundry Co., Indianapolis. He joined the company in 1907 as a salesman. He succeeds the late William G. Williams, who, with Griffith W. Williams, founded the company in 1900. Frank Mutz was named vice president and treasurer and C. I. Carey, secretary.

* * *

Howard Evans has resigned as secretary of the Philadelphia Foundrymen's association after holding this office since its organization. Until his retirement from business Mr. Evans was with the J. W. Paxson Co., Philadelphia, and is well known to foundrymen throughout the country. W. G. Summers, a member of the purchasing department of the Phoenix Iron Co., Philadelphia, has resigned as treasurer of the association.

E. S. Sparks will perform the duties of secretary and treasurer of the association. Mr. Sparks for a number of years has been secretary of the Metal Manufacturers' association, Philadelphia.

* * *

Charles W. Stiger, Chicago, has resigned as president of the Stromberg Carburetor Co. and has disposed of his interests in the business. His associates, Charles A. Brown and W. W. Wheelock, also of Chicago, who have been with Mr. Stiger ever since the company's organization, also have resigned from the board. They have been succeeded by Richard F. Hoyt, chairman of the Wright Aeronautical Corp.; C. M. Keys, head of the Curtiss Aeroplane & Motor Co., and Vincent Bendix, Chicago, president of the Bendix Corp. Mr. William O'Neill, former vice president of the Stromberg company, has been named president.

* * *

George H. Gray has been named purchasing agent of the Republic Iron & Steel Co. at Birmingham, Ala. Mr. Gray moved to the Birmingham district from Grand Rapids, Mich., in 1907 to become identified with the Republic company, then operating the properties of the Tennessee Coal, Iron & Railroad Co. He started in the stationary department, working his way up to be purchasing agent of the Tennessee company. He resigned in 1920 to become vice president of the Wofford Oil Co., Birmingham.

Henry M. Martin has been appointed credit manager and secretary to W. H. Oldham, vice president in charge of Southern properties of the Republic company. He was with the Tennessee Coal, Iron & Railroad Co. for over 26 years first as stenographer and then in other capacities in the operating, accounting, traffic, engineering, shipbuilding and executive departments.

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H. Hobart Porter, president of the American Water Works & Electric Co., New York, and of the Brooklyn City Railroad Co., Brooklyn, N. Y., has been elected chairman of the Engineering Foundation, New York. He succeeds L. B. Stillwell, who has served since 1925. Other officers reelected by the Engineering Foundation include: George A. Orrok, vice chairman; Arthur D. Little, vice chairman, and Alfred D. Flinn, director.

* * *

Charles A. Anderson Jr., formerly vice president in charge of sales of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, has been elected president, and A. V. Wadsworth, formerly manager of the Westcott Valve Co., East St. Louis, Ill., has been elected vice president and general manager.

Blake V. Fisher, formerly in the sales department, Westcott Valve Co., East St. Louis, Ill., is now affiliated with the sales department of the Pittsburgh Valve, Foundry & Construction Co., with headquarters at Dallas, Tex.

Henry Johnson has been appointed foundry superintendent of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh. He formerly was identified with the Westcott Valve Co., East St. Louis, Ill., in a similar capacity.

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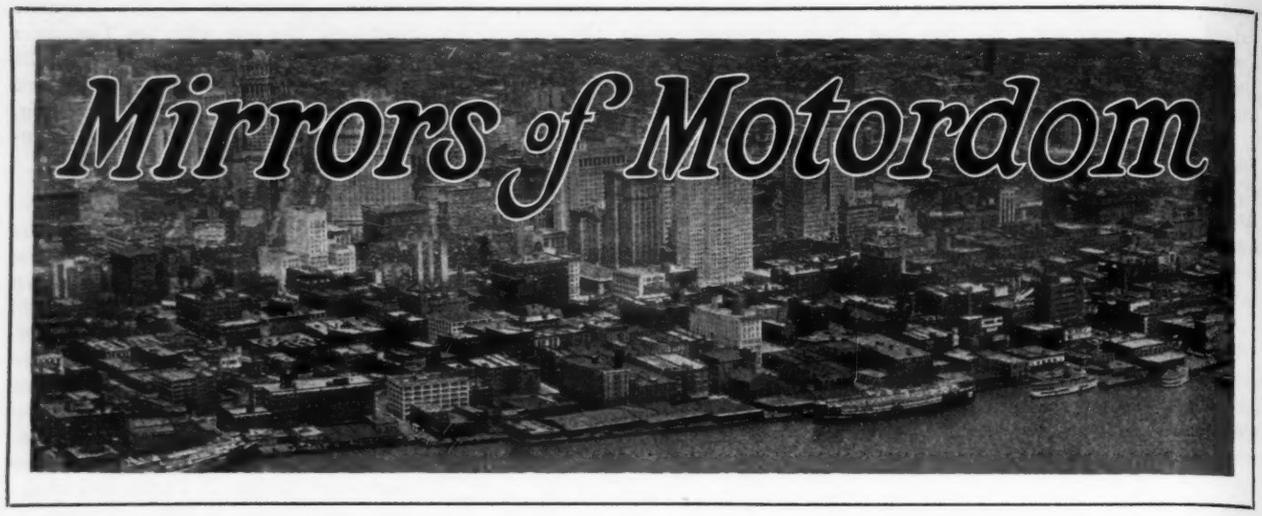
B. F. Baker, treasurer of the Kewanee Boiler Co., Kewanee, Ill., since its inception in 1892, was elected president of the Kewanee Boiler Corp. at the annual meeting March 6, and also was re-elected a director. He succeeds the late E. E. Baker, his cousin.

M. F. Moore was re-elected vice president in charge of production and R. B. Dickson was re-elected vice president in charge of sales. H. D. Cherry was re-elected secretary; E. F. Wagner, assistant secretary and Arthur Cook, assistant treasurer. Rolland J. Hamilton, vice president and secretary of the American Radiator Co., New York, was made assistant secretary of the Kewanee Boiler Corp.

The veins of Konigsberg, Norway, discovered in 1623 and owned by the State since 1636, have yielded most of Norway's silver since that date.



Ford Enlarges Facilities for Direct Iron Castings

* * *

Auto Production Still a Record, but More Spotty

Detroit, March 12

CASTING of hot metal direct from the blast furnace has become a production policy of the Ford Motor Co., and additional facilities for this method are in course of installation at the Fordson plant.

Molten iron tapped from the two Ford stacks is speeded to a 400-ton mixer in the foundry department. Into this mixer is also charged hot metal which has been melted in a cupola. Before being poured, this mixture is brought up to the desired temperature in two 15-ton electric furnaces.

At this time the bulk of the 6800 to 7200 cylinder blocks being cast daily at Fordson is accounted for by this process. Two 78-inch cupolas round out the needed capacity. Another 400-ton mixer and one more 15-ton electric furnace will soon be available.

* * *

THIS utilization of blast furnace metal without reheating, other than the rise imparted by the electric furnaces, is but a phase of the transformation in Ford production methods.

The gradual abandonment of the Highland Park plant in Detroit, which was the cradle of the Ford company, is in itself a silent revolution. Soon practically all wire wheels, of which current schedules now require upward of 38,000 daily, will be made at the Hamilton, O., plant. The bulk of the radiators will be processed at Green Island, Troy, N. Y. Many departments are being moved outright to Fordson, and in the moving changes in method are being effected.

* * *

A PHASE of this transformation, though unrelated to the removal from Highland Park, is the veering toward malleable iron castings in the Model A chassis.

When first brought out, Model A had no malleable castings at all. Comparable parts in malleable iron in old Model T were steel forgings in Model A. An obstacle popped up when the requirements for forgings approached the capacity not only of the Fordson plant but also the forging facilities within economical shipping distance of Ford assembly plants. Then, too, some of the new parts had never been attempted in malleable castings, and when this was done, economies in first cost and in machining were presented without any sacrifice of quality.

Now, on both the passenger car and the truck, malleable castings are used for the spare wheel carrier, steering gear case, steering column clamps, differential gear carriers, universal joint housing cap, brake adjusting brackets, starting crank bearings, transmission main shaft bearing container, accelerator bracket, tail lamp bracket and steering wheel hub.

On the truck alone the front wheel hubs, differential housing on the rear axle, rear spring seat and coupling shaft support are malleable iron. Such small parts as steps for sport coupe rumble seats, which do not run up into tonnage, are not listed. So soon as production can be arranged, all the parts enumerated on all units will be malleable castings. Many of the comparable parts in Lincoln cars are now malleable castings, according to Ford company officials.

Since the Ford company has no malleable iron capacity, all of these parts are being contracted for. Further experiments are in process and a shift from forgings to malleable castings for other important parts may develop shortly.

Meanwhile, the Ford company is employing forging and welding to a greater extent than ever before in its history. The capacity being freed at Fordson by the shift to malleable for these parts can be utilized on those parts which will continue to be made from forgings. Since the Highland Park plant, now being abandoned, never made forgings on a large scale, the large forging equipment at Fordson is practically a net gain for this process.

* * *

JANUARY and February set new high automobile production records by exceeding the comparable months of 1924, and March promises to carry on this gait. This is based upon the pressure being exerted by automotive makers for steel and pig iron. It has been many months since consumers, unable to obtain satisfactory deliveries from regular sources of supply, have been "shopping" among other makers, but usually in vain.

Government statistics put January output of trucks and passenger cars at 402,154, compared with 233,907 in

December and the previous January peak of 318,526 in 1924. With the national automobile chamber of commerce estimating February production, exclusive of Ford, at 324,344 units and Ford reporting 125,984, the total for February is 450,328. This estimate may prove high, but even so far exceeds the previous record of 370,319 in February, 1924. In fact, it is within hailing distance of the all-time record of 461,298 units last October.

The situation, however, is beginning to change. Increasingly the burden of large-scale production is being borne by Ford, Chevrolet, Willys-Overland, Pontiac and Hudson-Essex. The competition which many forecast would distinguish automobile retail selling in 1929 is budding. Considering past production and present capacity, Hudson-Essex is doing relatively better than other makers. Ford is not quite to the 7500 daily rate scheduled for early March, but for at least a year is expected to gain.

As usual at this season, assembly rates are in excess of actual retail absorption. Most makers, including Ford in some districts, are shipping more cars to dealers than the latter are now putting on the streets. In some districts Ford dealers are accepting other cars as well as Model T's in trade-ins. If this situation does not extend deeply into next month, when the spring buying season normally opens, it should occasion no alarm.

Chevrolet, it is understood, is outrunning its retail sales of a year ago and the assembly line has been slowed up because of a lack of power plants. Melting capacity in the foundries of this General Motors unit is the bottleneck, and extraordinary efforts are being exerted to remedy it, to the extent of installing additional capacity over week-ends.

Steel suppliers generally look for high automobile production, at least into May, with a record first half believed assured. So long as Ford and Chevrolet together are assembling over 13,000 cars daily no past record can stand.

* * *

WITH consumption of pig iron and coke at unprecedented levels, a tight delivery situation has resulted. One West Michigan foundry, part of whose product is Hudson-Essex cylinder blocks, is melting about 100 tons of pig iron, not counting scrap, a day. Constant tracing of cars is necessary to keep many melters from suffering interruptions.

Though there are just over 500 by-product coke ovens in the Detroit district, as high as 50 to 60 cars a day have been rolling in from other districts, even beehive coke from Connellsville, to satisfy the high foundry and domestic market.

If demand for pig iron remains brisk after navigation on the lakes opens, a Buffalo steelworks and a Chicago vessel agency expect to be active in the Michigan market.

* * *

WITH the transfer of all asembly operations on the Erskine models to South Bend, Ind., the Studebaker Corp. has practically withdrawn from the Detroit district. If Willys-Overland be included in the Detroit groups, Studebaker and Nash are the only large-scale makers on "foreign" soil.

* * *

BELIEVE it or not, but none other than Theodore Roosevelt is to blame for Detroit not having a steel industry sooner. More than twenty years ago, as the story runs, the late Antonio Pessano, then enterprising president of the Great Lakes Engineering Works, visualized a completely-integrated iron and steel works along the Detroit river just south of Detroit and not far from the Great Lakes yard.

To a moderate extent, in 1907, he succeeded in interesting the Jones & Laughlin company at Pittsburgh. But at the crucial moment President Roosevelt let loose a blast against "big business" and this Pittsburgh interest promptly abandoned the proposition. It is not far from this original site that George R. Fink, head of the Michigan Steel Corp., and his associates now plan to build the Great Lakes Steel Corp. works.

Devises New Process for Bright Annealing

Incandescent Heat Co. Ltd., British Mills, Cornwall road, Smethwick, Birmingham, Eng., has evolved a new process for bright annealing steel and nonferrous tubes in units handling large tonnages. The furnace and machine are mechanically operated and give a product free from discoloration. After the original breaking down pickling operations are eliminated. Straightness of tubes is maintained. The process is also applicable to ferrous and nonferrous bars. The Incandescent Heat Co. Ltd. handles a wide range of industrial furnaces and equipment and is negotiating the license and rights for this process in leading European countries.

Aluminum Co. of American has removed its office from 1228 Third National building, Dayton, O., to 910 Dixie Terminal building, Cincinnati.

Provide for River Work

Pittsburgh, March 12.—Funds for improvement work on the Ohio river system are provided in the allotment of $41,587,960 for river and harbor improvement and maintenance for the fiscal year beginning July 1, announced recently by the secretary of war. Last December it was estimated $50,781,880 could be profitably expended in 1929.

Allotments include: Ohio river, lock and dam construction, $1,250,000 and open channel improvement $1,259,000; Monongahela river, in Pennsylvania, and West Virginia $425,000; Allegheny river in Pennsylvania, lock and dam construction, $1,105,000 and open channel work $3000; Youghiogheny river, in Pennsylvania, $1700; Erie, Pa., harbor, $29,000.

Apprentice System Wins

Milwaukee branch of the National Metal Trades association has entertained last-year apprentices and prize winners at its sixth annual banquet, served in the Milwaukee vocational school building.

Harold S. Falk, chairman of the metal trades apprenticeship committee, presided. He stated apprentices in metal trade shops have increased from 910 to 990 in the past year, and the system has become an established institution. Robert L. Cooley, director of vocational education in Milwaukee, also spoke.

To Open Plating Works

F. B. Chandler, president and founder of the Chandler Motor Co., will establish a chromium plating works there in the Pennsylvania warehouse on Ashland road, southeast Cleveland. He has leased 75,000 square feet of space from the Union Trust Co. for four years at $3000 annually. The plant will do plating for the Cleveland branch of the Hupp Motor Car Corp. and for several other manufacturers.

Will Enlarge Coke Plant

The Rochester Gas & Electric Corp., Rochester, N. Y., will construct 37 by-product coke ovens at once. The new ovens will increase the company's coke output to 240,000 tons annually. The ovens will be 65 feet wide, 200 feet long and 60 feet high, with chambers 30 feet high, 20 feet long and 14 inches wide. They will have modern handling and stoking facilities.

The American Institute of Consulting Engineers has been admitted to membership in the American Engineering Council, New York.

Obituaries

EUGENE J. McCARTHY, 61, president of Beals, McCarthy & Rogers, Buffalo, warehouse distributors, died March 7. He located in Buffalo in 1888, after being affiliated with a hardware company in Auburn, N. Y. As salesman for Beals & Brown, hardware and warehouse dealers, his advancement was steady. In 1917 he was elected president and the company name was changed to Beals, McCarthy & Rogers. In trade, civic and club activities, Mr. McCarthy was a leader. He formerly was president of the American Steel and Heavy Hardware association. He was a director of the Manufacturers' & Traders-Peoples' Trust Co. and the Irish-American Savings & Loan association, and also was vice president of McCarthy Bros. & Ford, an electrical supply wholesale house.

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Homer F. Elwell, 58, head of the Elwell Iron Works, Springfield, Mass., died at his home in that city, Feb. 23.

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William F. Gibbons, vice president of the Cleveland Hardware Co., Cleveland, died at St. Petersburg, Fla., Feb. 20.

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Eugene J. McVoy, 57, president of the McVoy Sheet & Tin Plate Co., Chicago, died Feb. 25, in Cairo, Egypt, from a heart attack.

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James B. Sipe, president of J. B. Sipe & Co., Pittsburgh, manufacturers of paint for steel coating and marine use, died at his home in that city, March 6.

* * *

Samuel Tweedall, 73, superintendent of Evansville Tool Works, Evansville, Ind., died recently at his home in that city. He had been associated with the company nearly 40 years.

* * *

Francis M. Stambaugh, 63, vice president of the F. M. Stambaugh & Sons Inc., St. Louis, manufacturer of tools and dies, died March 7. He had lived in St. Louis for the past 40 years and had been in the manufacturing business 14 years.

* * *

Jessee J. Bowen, 57, district sales engineer for the Pangborn Corp., Hagerstown, Md., died Feb. 25 at his home in Rochester, N. Y. Mr. Bowen was the first field representative the company had. He became affiliated with it in 1906 and was well known in the foundry industry of New England, Illinois, Wisconsin, New York and Pennsylvania.

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Hal C. Belville, 42, former vice president and director of the Commonwealth Steel Co., St. Louis, and more recently vice president of the Rothaker Film Co., died Feb. 25.

* * *

Charles Dorman, 54, director of Dorman, Long & Co. Ltd., Middlesbrough, Eng., iron and steel manufacturer, construction engineer, bridge builder, etc., died Feb. 28. He was the eldest son of Sir Arthur Dorman, chairman of the company.

* * *

E. L. Kilhefner, 56, founder of the Elite Mfg. Co., Ashland, O., auto jacks, etc., and president of the Ashland college board of trustees, died March 2 in Long Beach, Calif. He was a director of the Ohio Manufacturer's association.

* * *

Benjamin Arrowsmith Hegeman Jr., 68, president, National Railway Appliance Co., New York, died March 6 at his home in that city. He also was president of the Hegeman-Castle Corp., Chicago, president of the Anglo-American Varnish Co., Newark, N. J., and president of the Genesco Corp., Rochester, N. Y.

* * *

Charles S. Bradley, 76, electrical engineer and inventor, died March 3 at New York. He was an engineer for the Edison Illuminating Co. in 1881 and two years later established his own research laboratory at Yonkers, N. Y., where he perfected inventions contributing to the development of electricity.

* * *

Charles T. Mullen, 68, former president of the Mount Vernon Furnace & Mfg. Co., Belleville, Ill., died March 7 at his home in that city. Mr. Mullen has been connected with the stove industry in Belleville for many years. He retired from the presidency of the Mount Vernon company about six months ago, after serving for about eight years. Previously he had been secretary-treasurer of the Belleville Stove Works, and an officer in the Quality Stove & Range Co.

* * *

Robert R. Richardson, 62, general manager of the Pittsburgh-Conneaut Dock Co., Conneaut, O., a subsidiary of the United States Steel Corp., died March 10 at Phoenix, Ariz., from pneumonia after a brief illness. He had been in charge of the harbor at Conneaut for almost 30 years and had been continuously associated with the Carnegie Steel Co. and the United States Steel Corp. for about 40 years, having been originally employed at the Carnegie company's Duquesne, Pa., works.

Consider Allegheny-West Penn Merger

Pittsburgh, March 12.—The Allegheny Steel Co. will acquire the West Penn Steel Co., both of Brackenridge, Pa., if negotiations now under way culminated successfully. Details are expected to be completed this week, according to H. E. Sheldon, president of the Allegheny company. Both the Allegheny and West Penn companies manufacture black, blue annealed and high grade sheets for automobile, electrical and metal furniture purposes, and due to the fact that plants of the two companies are adjoining, the merger will assist materially in expansion plans of the former.

The Allegheny company has an ingot capacity of 220,000 tons, while that of the West Penn company is 150,000 tons. If the present project is carried out, it is planned to continue to operate the two companies as separate organizations for the present, with an eventual consolidation. Julian Burdick is president of the West Penn company. The latter company has outstanding $1,050,000 of $100 par shares common stock out of an outstanding issue of $5,350,000, in addition to $525,000 of 7 per cent preferred stock.

New Steel Plant Started

Pittsburgh, March 12.—The National Forge & Ordnance Co., Irvine, Warren county, Pa., has started construction of a new electric steelmaking plant which is expected to be completed by the middle of this year. New construction includes two electric furnaces with soaking pits and heating units, additional forging capacity and additions to the machine shop. The company will make high grade alloy steels.

British Prices Moving Upward

Iron and Steel Output Increasing, with Continental Competition Dwindling—Tin Plate Mills Decide on Pooling Arrangement To Penalize Overproduction—British Pig Iron Output Drops in February

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, March 12.—(*By Radio*)—British iron and steel prices are moving upward, while competition from continental manufacturers is diminishing. British steelworks are busy and exports are increasing. Additional steelworks furnaces are being lighted in the Sheffield district. Tin plate producers have decided on a pooling arrangement, penalizing overproduction. This would obviate the fixing of minimum prices. The plan would substitute for the present periodical suspension for a week. The market for galvanized sheets is quiet.

Pig iron demand is improved. One blast furnace has been started at Northampton, and two in the Middlesbrough district will be blown in to make hematite, by the end of the month. West coast pig iron is being shipped to the Continent. Middlesbrough and Barrow pig iron prices may be advanced.

A dispatch from Berlin states German export business is quiet, and the domestic market is dull. Belgian iron and steel prices are firm. The domestic market in France is active.

British production of pig iron in February is estimated at 520,000 tons, compared with 563,900 tons in January, and 540,400 tons in December. On March 1, 142 stacks were in blast, four more than on Feb. 1. Steel ingot production in February is estimated at 775,000 tons, against 761,600 tons in January and 683,100 tons in December.

British Steel Market Continues Making Gains

BIRMINGHAM, Eng., Feb. 22.—The official returns of production show that the British output of steel ingots and castings having slipped back during December, has returned to its position attained in November, the total being 761,600 tons. The nearest figure to this was the May total of 752,700 tons. In pig iron January was the best month since April, totaling 563,900 tons. At the end of January 139 furnaces were in blast, an increase of 7 for the month, and within the last three weeks several furnaces have been relighted.

The significant feature of the Mid-

Sterling $4.85

land market is the determination of Northamptonshire furnacemen to force up the price of foundry iron. Only a fortnight ago the furnaces agreed to sell at £2 17s 6d ($13.93), and it is readily admitted that a good deal of business has been taken at this figure. It came as a surprise therefore on the Birmingham exchange yesterday to find that smelters with one consent were asking £2 19s ($14.29). They excuse their action by explaining that their object is to bring about a closer relationship with the price of Derbyshire iron now fixed at £3 2s 6d ($15.15). It is assumed Derbyshire ironmasters will be content to continue at that basis. It had the effect of putting a stop to business on the exchange. The consumption of foundries is no bigger but consumers have bought on the £2 17s 6d ($13.93) basis, in the belief that they would be wise to lay in stocks on a rising market. It remains to be seen whether this new attempt on the part of the smelters will meet with the same response. The new prices apply strictly

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 11	*British* Gross Tons U. K. Ports	*French* Metric Tons Channel Ports	*Belgium and Luxemburg* Metric Tons Channel Ports	*German* Metric Tons Rotterdam or North Sea Port
Export Prices f. o. b. Ship at Port of Dispatch—By Cable	£ s d	£ s d	£ s d	£ s d
PIG IRON				
Foundry No. 3, Silicon 2.50-3.00	$16.25 3 7 0*	$16.49 3 8 0	$16.49 3 8 0	$16.49 3 8 0
Basic	15.76 3 5 0	15.76 3 5 0	15.76 3 5 0	15.76 3 5 0
Basic-bessemer	17.58 3 12 6†	15.76 3 5 0	15.76 3 5 0	15.76 3 5 0
Hematite, Phosphorus 0.02-0.05	17.70 3 13 0	23.66 605*	....	17.46 3 12 0
SEMIFINISHED STEEL				
Billets	$31.53 6 10 0	$25.22 5 4 0	$25.22 5 4 0	$25.22 5 4 0
Wire rods	41.83 8 12 6	30.92 6 7 6	30.92 6 7 6	30.92 6 7 6
FINISHED STEEL				
Standard rails	$37.59 7 15 0	$31.53 6 10 0	$31.53 6 10 0	$31.53 6 10 0
Merchant bars	1.68c 7 15 0	1.35c 6 3 0	1.35c 6 3 0	1.33c 6 1 0
Structural shapes	1.60c 7 7 6	1.11c 5 1 0	1.11c 5 1 0	1.11c 5 1 0
Plates, ship, bridge and tank	1.76c 8 2 6	1.38c 6 5 0	1.38c 6 5 0	1.38c 6 5 0
Sheets, black, 24 gage	2.28c 10 10 0	2.28c 10 7 6	2.28c 10 7 6	2.50c 11 7 0
Sheets, galvanized, 24 gage, corrugated	2.96c 13 12 6	3.01c 13 13 9	3.01c 13 13 9	3.43c 15 12 0
Bands and strips	2.17c 10 0 0	1.40c 6 7 6	1.40c 6 7 6	1.40c 6 7 6
Plain wire, base	2.12c 9 15 0	1.71c 7 15 0	1.71c 7 15 0	1.65c 7 10 0
Galvanized wire, base	2.93c 13 10 0	2.17c 9 17 6	2.17c 9 17 6	2.17c 9 17 0
Wire nails, base	2.39c 11 0 0	1.80c 8 3 9	1.80c 8 3 9	1.72c 7 16 0
Tin plate, base box 108 pounds	$ 4.37 0 18 0	....	....	$ 6.79 1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported		Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.25 3 7 0	$18.57	475(2)	$16.68	600	$18.51 78
Basic pig iron	15.76 3 5 0	19.94	510(1)	16.96	610	20.88 88
Furnace coke	3.52 0 14 6	5.87	150	5.56	200	5.10 21.50
Billets	30.92 6 7 6	23.07	590	24.60	885	28.72 121
Standard rails	1.79c 8 5 0	1.46c	810	1.63c	1,250	1.51c 140
Merchant bars	1.68c 7 15 0	1.36c	755	1.42c	1,090	1.52c 141
Shapes	1.71c 7 17 6	1.26c	700	1.22c	940	1.49c 138
Plates, ship, bridge and tank	1.87c 8 12 6‡	1.54c	855	1.46c	1,125	1.71c 158
Sheets, black, 24-gage	2.28c 10 10 0	2.92c	1,620	2.70c	2,080	2.43c 225
Sheets, galvanized 24 gage, corrugated	2.96c 13 12 6	3.69c	2,050	3.84c	2,950	3.78c 350
Plain wire	2.12c 9 15 0	1.94c	1,075	2.08c	1,600	2.48c 230
Bands and Strips	2.17c 10 0 0	1.51c	840	1.76c	1,350	1.77c 164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 14s 6d ($3.52) f. o. b. Ferromanganese £21 13s, 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

to Birmingham and the Black Country and they would be shaded for an attractive order in other parts of the country. Owing to scarcity of Middlesbrough iron, local consumers have been obliged to supplement their supplies. Many furnaces are still idle in the Middlesbrough area, and makers are not rushing to increase the output until they are satisfied that demand warrants it. The severe weather has upset transport arrangements, both in Middlesbrough and the Midlands. The New Cransley furnace, which was to have started this week, was delayed owing to frozen pipes and the difficulty of obtaining fuel, much of which is brought by canal.

Shipments of Middlesbrough pig iron are well ahead of the corresponding period of January. Recent sales have included lots for consumption in Scotland and small parcels for the continent. No. 3 is firmly maintained at the new figure of £3 7s ($16.24). In the east coast hematite trade the output is not sufficient for the market, and the question of relighting furnaces is urgent. With makers in a strong position prices are inclined to firmness and the minimum quotation for mixed numbers is £3 12s ($17.45).

The manufactured steel trade in the Middlesbrough district is better than for a long time and the consumption of local iron is the best evidence of renewed activity. The inquiry is chiefly for shipbuilding steel as the structural trade is still operating much below capacity. Prices are unchanged and the association so far has not indicated any possibility of alteration, although the increasing cost of raw material has already been reflected in advances in semifinished material. In South Wales sheet bars have been raised to £6 2s 6d ($29.70) delivered, and soft billets are up about 5s ($1.21) per ton on the Middlesbrough market. Birmingham merchants have not found any increase in continental business and do not expect any in view of the high quotations coming through. English billets are £6 7s 6d ($30.91) on the Birmingham exchange and the makers are in a somewhat better position.

The steel industry on the west coast is active but new orders are few. A new liner built to the order of the Orient Steam Navigation Co. Ltd. will be launched by Vickers Armstrong Ltd. at Barrow on Feb. 26.

While buying has not been quite so brisk in galvanized sheets, mills are busy and will be able to maintain full operations until the end of first quarter. The price varies from £13 12s 6d ($66.06) to £13 15s ($66.67) and where work is urgently needed an even lower price has been heard of, but there are a number of works which can afford to turn down business below £13 15s ($66.67).

The tin plate trade is comparatively quiet, although some inquiry has come out from Continental exporters. The minimum price of 18s ($4.37) to 18s 3d ($4.43) still prevails, but there is every probability of an advance in view of increasing costs of production. Steel scrap has become scarce and dear as consumption has expanded a good deal during the last few weeks.

Believe Rail Syndicate Will Continue

London, Feb. 22.—(*European Staff Service*)—It is reported that the French management of the rail syndicate, known as the ERMA, believe that the syndicate will be renewed. It is pointed out that the British have largely profited by this comptoir, since certain territories have been reserved to them, particularly the British dominions, and in these markets British makers can sell their rails at anything up to £2 ($9.70) higher than continental prices. This probably would not be the case if the ERMA did not exist, because continental producers probably would compete with the English, even in their own markets.

It is generally accepted that basic bessemer rails are not as lasting as open-hearth rails, but it is none the less true that, where there is a considerable difference in price, many companies adopt basic bessemer rails, and not so very long ago a French works sold a tonnage of rails to the Irish Free State. Furthermore, French, Belgium and Germany railways use basic bessemer rails. This leads many observers to believe that the British will not insist on their quota being considerably increased.

British Founders Form Castings Merger

London, Feb. 26.—(*European Staff Service*)—Negotiations between owners of a number of British foundries with a view to arranging a merger have resulted successfully. It now is announced that a corporation has been formed which may be called Associated Foundries, Ltd., and of which the total capital probably will be £3,000,000 ($15,000,000).

This announcement results from a provisional agreement arrived at between the Sinclair Iron Co., Ltd., manufacturer of rain-water goods and builders' light castings, and the Austin Friars Trust, Ltd., for the formation of a company to acquire the shares of the Sinclair Iron Co., Ltd., and eight other firms in the light castings trade. These firms are: Abbots Foundry Co., Ltd., of Falkirk, makers of ranges, stoves, grates and light castings; Burton Foundry Co., Ltd., of Burton-on-Trent, makers of ranges, fireplaces and stoves; Callendar Iron Co., Ltd., of Falkirk, manufacturers of light castings; J. Clay (Wellington), Ltd., Ketley, Wellington, makers of light castings, and agricultural engineers; R. W. Crosthwaite, Ltd., of Thornaby-on-Tees, manufacturers of light castings and cast iron pipes; The Falkirk Iron Co., Ltd., of Falkirk, stove and general iron-founders; Forth & Clyde & Sunnyside Iron Companies, Ltd., of Falkirk, makers of ranges and stoves and architectural iron work; Light Castings, Ltd., of Audenhaw, near Manchester.

Belgian Steelmakers Hold Strong Advantage

BRUSSELS, Feb. 22.—(*European Staff Service*)—The Belgian iron and steel market continues well balanced, and order books are well filled. The position of producers is strong and there is no tendency toward price breaking. It is true that new orders for merchant bars are scarce, and this does not affect the works unsatisfactorily on the contrary, they accept this situation with enthusiasm. It is stated that the cold weather has interfered with operation of transport and deliveries to Antwerp consequently are retarded. To meet this situation the works are slightly reducing production, in order not to build up important stocks. The works themselves have suffered from the intense cold, owing to burst pipes and the impossibility of quenching coke. Demand for fuel is active. Stocks are the lowest registered for two years. There is a large demand for anthracite for domestic purposes. Industrial coal is becoming scarce, and it is expected that the price of coke will rise.

The comptoir of foundry pig iron will commence operations March 1. It will be organized in the form of a co-operative company, with head office in Brussels, and will be managed by M. Mousseaux of the Halanzy works. Demand for semifinished steel is strong and there are few offers. Some business has been done in a small way in billets. Two-and-a-half-inch billets are quoted at £5 4s ($25.21), 2-inch billets at £5 5s ($25.45) and 3 to 4-inch billets at £5 2s 6d to £5 3s ($24.85 to $24.97).

There has been little business in blooms. Eight-inch blooms are quoted at £4 15s ($23) and 6-inch blooms at £5 ($24.25). There have been some transactions in sheet bars, and the Acieries de Longwy sold a tonnage at £5 5s 6d ($25.57) at the beginning of the exchange meeting in Brussels Feb. 20. Another works has taken an order for 1000 tons at £5 6s 3d ($25.75), while an additional 1000 tons has been taken at £5 7s ($25.93). These prices show that those absolutely in need of semi-finished steel have to pay a good price. Normal size beams are £5 1s ($24.49), and British sizes are £5 3s ($24.57). Merchant bars remain at about £6 3s ($29.82).

While business now is somewhat restricted, plenty of rumors are going about concerning the prorogation of the various comptoirs, including the steel entente and the ERMA. It is generally believed they will be renewed. It has been said the British are demanding a considerable increase in their quota of sales for rails, and that the Belgians intend to formally refuse, but, according to serious sources, there are reasons to hope that these differences will be settled readily.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

ATLAS CAR & MFG. CO., Cleveland, has taken orders for cars for export, which indicate the trend toward American methods in handling bulk materials at blast furnaces and coal docks. For the Soviet republic, Russia, it is building two 20-ton double compartment scale cars, self-propelled, electric motor driven, with indicating and recording scale dials; one 50-ton self-heating, combination ore car, with pusher arm, electric motor driven, self-propelled. For the Anzan Works, South Manchuria, it has an order for two blast furnace scale charging cars, with indicating and recording dial scales. For the South Manchurian Railway Co. it has an order for four 75-ton center bottom discharge gate pier cars for handling materials from the car dumpers to the dock handling equipment, in combination with Alliance Machine Co. type loaders.

* * *

ALGOMA STEEL CO., Sault Ste. Marie, Ont., is relining two hot blast stoves, under direction of Freyn Engineering Co., Chicago. Chimney valves and pressure burners designed by the latter are being installed.

* * *

TRUSCON STEEL CO. has opened a district office at 310 Seaboard building, Seattle, with Edward F. McDonough, district manager, and Frank Nichol, chief engineer. The district includes Washington and Idaho.

* * *

CELLOSILK MFG. CO., 410 Sullivan street, Chicago, manufacturer of surgical and drug supplies, has purchased the plant formerly owned by the American Malleable Iron Co., near Barrington, Ill. Extensive remodeling work is planned.

* * *

NORTHSIDE PATTERN & FOUNDRY CO., 3616 Colerain avenue, Cincinnati, has been organized to succeed the Buckeye Pattern Works. The new company has erected an addition for the manufacture of bronze and aluminum castings.

* * *

UNITED IRON WORKS, manufacturer of mining and oil field equipment, will move its general offices April 1 from Kansas City, Mo., to Tulsa, Okla. Headquarters will be on the fourteenth floor of the Hunt building. The company operates plants in Missouri and Oklahoma. D. C. Morrow is president, J. H. Campbell vice president, and T. R. Stokes secretary.

* * *

PREST-O-LITE CO. INC., New York, has started operation of a plant at 925 Hughes street, Houston, Tex., in charge of A. J. Harrower, superintendent. The branch is under supervision of H. F. Sautter, district superintendent at Dallax, Tex.

* * *

UNITED CARBIDE CO., New York, has removed its technical publicity department from the Carbide & Carbon building, 30 East Forty-second street, to the Bartholomew building, 205 East Forty-second street.

* * *

LOS ANGELES VALVE & MFG. CO., 1650 North Indiana street, Los Angeles, has been incorporated with $250,000 capital by A. W. Warr, B. F. Miller Jr., J. B. Roof and E. M. Buckius, all of Los Angeles, to succeed the Los Angeles Valve & Fittings Co.

* * *

BALDWIN CHAIN & MFG. CO., Worcester, Mass., has re-elected officers as follows: Frank J. Weschler, president and treasurer; William C. Cole, vice president and clerk; Henry P. Blumenauer, George T. Dewey, William H. Gates and Messrs. Weschler and Cole, directors.

* * *

WISCONSIN ELECTRIC CO., Racine, Wis., has changed its name to Dumore Electric Co., to identify it better with its principal product, fractional horsepower motors. Capital is being increased from 500 to 3000 shares of no par value. Louis H. Hamilton is president and Harry F. Nehoda is secretary.

* * *

MUEHLHAUSEN SPRING CO., Logansport, Ind., has added a railway spring division to produce heavy flat and coil springs from ½-inch to two inches. George Allan, formerly of the Allan-Watson Co., is in charge.

* * *

METAL STAMPING CO., West Bend. Wis., has abandoned its plan for building a new plant, and has bought the plant formerly occupied by the S-Line Co., Milwaukee, at Barton, a suburb of West Bend. The plant is 80 x 128 feet on a site of two acres. The new owner will install considerable new equipment. C. P. Davey is general manager.

* * *

ARMSTRONG CORK CO. announces consolidation of the offices of all its divisions at Lancaster, Pa., as of April 1. This involves removal from Pittsburgh of the general offices of the company and all executive offices of the Armstrong Cork Co., cork division, and of the Armstrong Cork & Insulation Co., except the purchasing department, which will remain in Pittsburgh.

* * *

AMERICAN BRAKE SHOE & FOUNDRY CO. of California, A. L. Clark vice president and general manager, has purchased three acres on the north side of Slauson avenue east of the Los Angeles river, Los Angeles, where it will erect a gray iron foundry for the manufacture of brake shoes for steam and electric railways. The present foundry is at 1179 East Thirty-second street.

* * *

JENSEN RADIO MFG. CO., with a plant in Oakland, Calif., has arranged for the concentration of manufacturing operations in Chicago, having purchased a lease, with option, for industrial property at 6601 South Lorel avenue, Chicago, from the Clearing, Ill., industrial district. The property embraces 27,000 square feet. The company manufactures a dynamic cone speaker and other radio accessories.

* * *

KISSEL MOTOR CAR CO., Hartford, Wis., is preparing to add extensively to its machine tool equipment to care for heavy production. It has taken a contract for 3000 taxicabs for the newly-organized Bradfield Motors Inc., Chicago. A contract for 1000 funeral coaches annually for the National Casket Co., New York, is entering its second year. Building of its custom-built automobiles will be continued, also.

* * *

HEADFORD BROS. & HITCHINS FOUNDRY CO., and the Hawkeye Foundry Co., both of Waterloo, Iowa, have been consolidated and the

capital stock of the Headford concern has been increased from $75,000 to $200,000 to provide funds for expansion. The combined companies will have an annual capacity of 7500 tons of castings. Officers of the company are: Edward H. Headford, president; Frank O. Hitchins and William T. Headford, vice presidents; W. E. Robinson, secretary and treasurer.

* * *

ALGONAC BRASS FOUNDRY, Algonac, Mich., has changed its name to Algonac Foundry Co. W. E. Warner is president.

* * *

ERIE MALLEABLE IRON CO., Erie, Pa., has opened a branch at 701 Thrower building, Atlanta, Ga., with E. E. Dawes as district manager.

* * *

JONES & LAUGHLIN STEEL CORP., Pittsburgh, has established a sales office at 1313 Healey building, Atlanta, Ga., with William Miller district manager.

* * *

KOPPERS CO., Pittsburgh, has taken a contract for 15 Becker type horizontal ovens for a coal gas plant at Sheboygan, Wis., for the Wisconsin Public Service Corp.

* * *

MELLING FORGING CO., Lansing, Mich., has increased its capital from $100,000 to $300,000. Stockholders have re-elected directors for the coming year.

* * *

STEUBING COWAN CO., Cincinnati, builders of lift and industrial trucks and skids has tripled capacity at its plant at Holyoke, Mass., where considerable equipment was added.

* * *

WESSLING BROS. FOUNDRY CO., Cincinnati, has purchased the plant of the American Foundry & Machine Co., Hamilton, O., and plans to remove its major operations there.

* * *

ROBBINS & MYERS INC., Springfield, O., manufacturer of motors, generators, and fans, has established a branch office at Atlanta, Ga., in charge of Carl V. Malone, to handle trade in southeastern states.

* * *

DETROIT FORGING CO., Detroit, has elected Edwin R. Wegner president and general manager; J. Farrand Williams, vice president; N. H. Macqueen, secretary; Arthur L. Rose, treasurer, and Andrew Bachle and Sheldon R. Noble, directors.

* * *

PITTSBURGH AVIATION INDUSTRIES CORP., Pittsburgh, has had plans made for a plant at Pittsburgh for the manufacture of an all-metal monoplane which has been built heretofore at San Francisco by H. V. Thaden. A temporary location will be used until a plant can be built adjoining the proposed municipal airport. George R. Hann is president of the company. Mr. Thaden formerly was associated with the airplane division of the Ford Motor Co. and the Aircraft Development Corp., Detroit. He will head the technical staff.

* * *

NEWMAN MFG. CO., Cincinnati, manufacturer of ornamental brass, bronze, steelwork and similar products, has appointed Grover E. Rose as its exclusive sales and service representative in the Durham, N. C., district, with headquarters in this city.

* * *

CENTRAL ALLOY STEEL CORP., has received an order for its rust-resisting product, toncan iron, for 11 miles of pipe required by Trinidad Leaseholds, Ltd., of Trinidad, British West Indies. The pipe will be used for oil gathering lines, and will be supplied in 30-foot lengths with ends grooved for special couplings.

* * *

NEW DEPARTURE MFG. CO., Bristol, Conn., manufacturer of ball bearings, has started an enlargement program which will add 250,000 square feet at the main Bristol plant and 80,000 square feet at the Meriden plant. The forge plant at Bristol has been enlarged by 25,000 square feet.

* * *

SOUTHERN STATES CABLE CO., Mobile, Ala., a subsidiary of the General Cable Co., has started production at its new plant at Mobile. Harry Parker is plant manager. Sales offices have been established at Birmingham, Ala., Dallas, Tex., Charlotte, N. C., and Atlanta, Ga. The plant is 120 x 540 feet.

* * *

BISHOP & BABCOCK SALES CO., Cleveland, has opened a sales office in the American Traders Bank building, Birmingham, Ala., in charge of Quin W. Stewart. He will specialize in the sale of air washers, unit heaters and steam heating specialties for this company.

* * *

CARNEGIE STEEL CO., Marine department, has taken over the floating equipment of the American Steel & Wire Co. The Carnegie company now operates the largest fleet on inland rivers. Capt. A. O. Ackard, who for several years acted as general superintendent of river transportation of the Carnegie line of steamers, will continue in that capacity while Capt. James Moren, who was in charge of the river division of the American Steel & Wire Co. and assisted in its organization 29 years ago, will continue in the latter company's service.

* * *

TRUE TONE CORP., Johnsonburg, Pa., is being organized and will establish offices and a plant there. It will manufacture electric lamps, sweepers and other types of devices. The organizers are E. N. Wallis, R. N. Jones, N. A. Myers, G. K. Spence and August A. Larson.

* * *

AMERICAN TUBE & STAMPING CO., Stanley Works, Bridgeport, Conn., has placed an order with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for seven motors. Five will be synchronous, 700 to 1400 horsepower, and two variable speed of 100 horsepower. Control equipment is included. The synchronous motors will be direct connected to the various stands of a combination 20-inch, 14-inch and 12-inch strip mill of cross-country design. The smaller motors will drive the edging roll.

* * *

J. D. ADAMS CO. was formed recently in Atlanta, Ga., as a subsidiary organization of J. D. Adams & Co., Indianapolis, Ind., manufacturers of road building and maintenance machinery, and has established headquarters at 1070 Murphy avenue, S. W., Atlanta, to handle Adams equipment in Georgia. Later additional territory will be added until the entire Southeast is being served from the new branch. Kirk J. Kendall is district manager, assisted by H. B. Groff, who has been transferred from Kansas City.

* * *

GRAY IRON INSTITUTE, Cleveland, has formed a trade practice committee, which will function as a subcommittee of the merchandising committee. It consists of the following: Chairman, Ralph M. Hill, East St. Louis Castings Co., East St. Louis, Ill.; Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md.; Chester A. Peebles, Stedman's Foundry & Machine Works, Aurora, Ind.; E. L. Weiland, Milwaukee Gray Iron Foundry Co., Milwaukee; W. J. Maton, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

* * *

KRONE-SEBEK DIE CASTING & MFG. CO., 64-66 West Austin avenue, Chicago, has quadrupled its facilities through the purchase of the former plant of the Fiel Mfg. Co. at West Forty-seventh street and Richmond avenue. The new property consists of a one and two-story building covering

(*Concluded on Page* 764)

Machinery

General Electric Continues Heaviest Buyer —Crane Sales Unusually Large—Railroads Will Help—Tractor Builder to Buy Soon

STEADY inquiry for machine tools and orders in prospect are features of the market this week. Lists under negotiation still include diversified sizes and types of miscellaneous items. Production tools continue in heavy demand in the East and manufacturers are operating their shops close to capacity. Large lists still are lacking but the aggregate of the tools in demand is sustaining business in most every district. Shipments have become a source of importance and many buyers have been compelled to line up used tools to meet their present requirements. Grinding machines are in brisk demand in the Chicago district and deliveries are being further extended. Manufacturers of material handling equipment report the sale of numerous crawler cranes.

New York, March 12.—Heavy buying by General Electric Co. against its recent list of some 70 or 75 items for its radio department at Schenectady, N. Y., features a continued active market generally. In addition, this company continues to issue scattered inquiries. A recent buyer was New York Air Brake Co., Watertown, N. Y., previously noted as having inquired for several machines, including an engine lathe, a horizontal borer and a shaper.

The Chesapeake & Ohio railroad, which recently placed 8500 tons of structural steel for shops at Huntington, W. Va., and Russell, Ky., will require a large number of machine tools. Its list includes 21 electric overhead cranes, ranging from five to 250 tons. Notable also in the material handling field is the award of a large number of 8-ton crawler cranes by the Pennsylvania railroad. The original inquiry involved 25, although as high as 60 are definitely scheduled for placing this year.

Pittsburgh, March 12.—Inquiry for machine tools continues steady and some improvement is noted in recent orders. The market still lacks large orders, however, with a few tools at a time representative of current business. Westinghouse Electric & Mfg. Co. has placed several additional tools on its first quarter list, but several pending inquiries for other users in this district remain open.

Worcester, Mass., March 12.—Makers of machine equipment in several lines note a tendency to buy more freely. This is especially true in drilling machinery and with makers of tools on special order. Demand for production units continues without abatement and March volume is holding well up to that of February. Buying is well spread and most makers are operating close to capacity. There is an absence of large lists, but the total of smaller orders is impressive Railroads are inquiring for scattered tools, mostly lathes. Automotive demand, which has been heavy, continues active, although a slight drop is noted by some makers. Steel mills and metal plants are contracting for more equipment and one central Massachusetts maker has booked several months' output of this business, much of the heavier type. Small tools are in good demand and used tools are selling better and in many instances commanding firmer prices.

Cleveland, March 12.—Current inquiry and prospective orders indicate no interruption in the trend of machine tool buying. Business is diversified as to size and type and scattered buying still is reported. The delivery situation on new tools has had a stimulating effect on the used toool market. In some cases dealers of used equipment are meeting with difficulty in locating items desired by the trade. No larger orders are encountered, business being sustained by the aggregate volume. While February sales were heavy, the trade expects to report a large volume in March.

Chicago, March 12.—Machine tool buying holds to the brisk rate of February. The delivery situation remains acute, lengthened shipments extending even to lighter equipment. Distributors of one line of surface grinders are forced to extend their delivery promises to six weeks. A maker of combination punch and shear machines is unable to promise delivery before June 1. Santa Fe has added additional items to its list of inquiries, including some specialty tools and welding equipment. Chicago, Milwaukee, St. Paul & Pacific is asking bids on a heavy duty 12-spindle rail drill and a few other tools. Bucyrus-Erie Co., which ordered a horizontal boring and milling machine recently for its South Milwaukee, Wis., works, is expected to be in the market soon for other equipment. Allis-Chalmers Mfg. Co., Milwaukee, is expected to buy equipment soon for its lighter tractor plant. An industrial concern north of Milwaukee ordered a heavy duty 5-inch spindle horizontal boring and milling machine. Sales have been active in Rockford and Moline, Ill., and Davenport, Iowa. Indianapolis and Fort Wayne, Ind., have several good sized lists pending. Demand is good for high speed, ball-bearing drills, and lathes are active. Orders for shapers are less numerous. Several dealers have nearly cleared their floors of used tools. The character of present business is largely scattered industrial orders.

CRANE ORDERS PLACED

Large number of 8-ton crawler cranes of Pennsylvania railroad, placed with Northwest Engineering Co., Browning Crane Corp. and Bucyrus-Erie Co.; inquiry called for 25 of these cranes, although 60 are scheduled for placing this year.

Among single orders are: 25-ton electric overhead crane for Levering & Garrigues Co., Dunellen, N. J., reported to Milwaukee Electric Crane & Hoist Corp. 100-ton electric crane for a power plant at El Paso, Tex., awarded through Stone & Webster, Boston, to Shepard-Niles Crane & Hoist Co.; 10-ton used crawler crane for LaFrance Stone Co., Toledo, O., to unnamed seller; used 20-ton locomotive crane for Manitoba Bridge & Iron Co., Winnipeg, Mann., to unnamed seller. 7½-ton truck crane for moving 10-ton transformers, awarded by Brooklyn Edison Co., Brooklyn, N. Y., to Universal Crane Co.

CRANE ORDERS PENDING

Twenty-one electric overhead cranes for Chesapeake & Ohio railroad, bids asked; specifications call for one 5-ton, one 10-ton and 18 15-ton cranes, with spans ranging from about 76 to 79 feet, and a 250-ton, 5 motor crane with 92-foot span.

Two 5 or 10-ton electric cranes, 85-foot span, for American Copper Products Co., Elizabeth, N. J., early action expected.

Two trolleys, one 5-ton 2-motor and the other 10-ton 2-motor, for H. D. Conkey & Co., Mendota, Ill.

Four 10½-ton, I-leg gantry cranes for General Steel Castings Corp., with temporary offices at Baldwin, Pa.; these are in addition to 14 electric overhead cranes, ranging from 10 to 75 tons, on which action is being expected almost momentarily.

One 50-ton locomotive crane for Baltimore & Ohio railroad.

One 3-ton electric traveling crane for fire department repair shop at Milwaukee.

Opens Stamping Plant

General Blanking & Stamping Corp., Detroit, has bought the plant of the Michel Cooperage Co., East Market street and the Baltimore & Ohio railroad, Sandusky, O., and will equip it for the production of automotive and other blanks and stampings, fenders, splashers, door panels, steel barrels and flat disks.

L. H. Kilets, Detroit, is president and treasurer of the company, John D. Stanton vice president in charge of sales, Edward R. Stanton secretary-treasurer, Ralph S. Hayes and David E. Hokin, directors, all of Detroit.

The equipment will include 12 large presses. The site is two acres, and buildings cover 48,000 square feet of floor.

Iron, Steel Index Up

Washington, March 12.—Iron and steel production index number for January was 117, compared with 107 for January of last year and 123 for December, according to the department of commerce, taking 1923-1925 at 100.

Iron and steel unfilled orders for January is given at 86, compared with 89 for January, 1928, and 83 for December.

Here and There

(*Concluded from Page* 762)

100 x 300 feet and containing 54,000 square feet of working space. The company manufactures radio and automotive equipment and die castings for dies for ornamental equipment, brass and aluminum castings.

* * *

NORTH AMERICAN REFRACTORIES CO., recently formed by consolidation of six refractory manufacturers, has established headquarters at Cleveland, on the tenth floor of the National City Bank building.

* * *

ALLIANCE MACHINE CO., Alliance, O., has received an order from the Aluminum Co. of America for a 10-ton traveling shop crane, the main girders of which will be constructed from strong aluminum alloy. This use of aluminum will materially reduce the wheel load on the building and, it is expected, will also reduce operating costs. The crane will be installed in the new structural shape mill at the Aluminum company's Massena works. At the same time it is planned to install a duplicate of this crane, built of steel, in the blooming mill at Massena so that direct comparisons of operating expenses can be made.

* * *

SQUARE D CO., Detroit, manufacturer of electrical devices, has completed an addition to its switch and panel plant at Detroit, which will increase capacity in that division 20 per cent. Other additions at Detroit and at the plant of the recently merged Industrial Controller Co. at Milwaukee are under way.

Iron Ore Held to High Standards

AVERAGE analyses of iron ore shipped from the Lake Superior district in 1928 show the mine operators are succeeding in their efforts at holding down the proportion of silica, while keeping up the percentage of iron natural close to standard requirements. More than three-fifths of all the iron ore shipped is of the low phosphorus, nonbessemer grade. By curious coincidence there was a decrease of 0.23 per cent in the proportion of iron natural in this grade, and also a drop of 0.23 per cent in the amount of silica. There was no change in the proportion of phosphorus. Moisture was 0.10 per cent lower than in 1927, while there was a gain of 0.03 per cent in manganese. The average analyses for the low phosphorus, nonbessemer ore are as follows: Iron natural 50.80 per cent; phosphorus 0.076 per cent; silica 7.87; manganese 0.71; moisture 12.44.

Less than 8 per cent of all the ore shipped was high phosphorus, nonbessemer, the average of phosphorus amounting to 0.43 per cent. Bessemer ore constituted one-fourth of the total, and the average analyses of this grade follow: Iron natural 54.56 per cent; phosphorus 0.04 per cent; silica 8.01 per cent; manganese 0.37 per cent and moisture 9.65 per cent. The standard market grade of this ore calls for an average of 51.50 per cent iron natural. The actual average for the bessemer is more than 3 per cent above this standard. The proportion of silica advanced from 7.85 per cent in 1927 to 8.01 per cent in 1928.

Manganiferous ore made up 4.4 per cent of the total. The iron natural in this grade averaged 42.76 per cent, practically the same as in 1927. Manganese content increased from 6.40 to 6.59 per cent; silica rose from 8.04 per cent to 8.87 per cent, while moisture dropped from 12.93 to 12.16 per cent. The average of all grades, all ranges as compiled by the Lake Superior Iron Ore association shows little deviation from 1927. The following table shows annual comparisons:

BESSEMER

Year	Tonnage	Iron (Nat.)	Phos.	Silica	Mang.	Moist.	% of Total
1928	13,288,421	54.56	0.040	8.01	0.37	9.65	24.6
1927	12,216,884	54.67	0.039	7.85	0.38	9.62	23.6
1926	15,041,032	55.16	0.040	7.63	0.37	9.28	25.4
1925	14,916,817	54.80	0.040	8.17	0.36	8.99	27.2
1924	12,009,417	54.80	0.040	8.10	0.34	9.33	27.7
1923	17,959,468	54.98	0.039	7.74	0.34	9.25	29.9
1922	12,795,108	54.57	0.040	7.90	0.35	9.68	29.5
1921	7,288,838	54.36	0.040	7.87	0.36	9.69	32.4
1920	18,398,643	54.18	0.042	7.55	0.46	10.10	31.8
1919	15,038,706	53.96	0.043	7.64	0.45	10.40	32.2

LOW PHOSPHORUS, NONBESSEMER

1928	33,574,275	50.80	0.076	7.87	0.71	12.44	62.1
1927	31,777,275	51.03	0.076	8.10	0.68	12.34	61.4
1926	36,192,728	51.39	0.077	7.98	0.67	11.68	61.2
1925	31,917,753	51.46	0.075	7.82	0.71	11.57	58.3
1924	25,007,322	51.25	0.075	7.95	0.68	11.75	57.8
1923	34,608,092	51.09	0.077	7.93	0.70	11.85	57.7
1922	24,947,827	51.35	0.077	7.95	0.69	11.67	57.4
1921	13,108,716	51.23	0.075	8.01	0.73	11.95	58.2
1920	30,645,514	51.18	0.079	7.84	0.69	12.13	52.9
1919	24,671,658	50.89	0.080	7.88	0.72	12.29	52.9

HIGH PHOSPHORUS, NONBESSEMER

1928	3,939,444	51.16	0.430	7.05	0.41	9.14	7.3
1927	4,269,987	50.86	0.443	7.32	0.38	9.28	8.3
1926	4,424,939	51.11	0.439	7.41	0.35	9.09	7.5
1925	4,532,815	50.85	0.414	7.87	0.35	8.88	8.3
1924	3,835,218	50.86	0.402	7.88	0.40	9.43	8.9
1923	3,869,686	50.86	0.416	7.69	0.33	8.98	6.4
1922	3,391,886	50.94	0.439	7.59	0.42	8.99	7.8
1921	1,480,759	51.07	0.427	7.26	0.44	9.07	6.6
1920	5,452,890	50.91	0.414	7.68	0.40	9.30	9.4
1919	4,648,067	50.72	0.428	7.61	0.39	9.49	9.9

MANGANIFEROUS

Year	Tonnage	Iron (Nat.)	Phos.	Silica	Mang.	Moist.	% of Total
1928	2,354,635	42.76	0.228	8.87	6.59	12.16	4.4
1927	2,402,442	42.81	0.236	8.04	6.40	12.93	4.6
1926	2,296,065	42.64	0.245	7.61	6.83	12.56	3.9
1925	2,247,472	43.46	0.221	7.17	6.57	12.69	4.1
1924	1,438,241	43.74	0.249	6.84	7.00	11.61	3.3
1923	2,441,586	44.03	0.266	6.75	6.36	11.23	4.1
1922	1,592,266	44.96	0.204	6.71	5.88	11.66	3.7
1921	230,726	46.41	0.159	7.59	4.71	13.02	1.0
1920	2,377,560	45.33	0.201	7.64	5.23	11.68	4.1
1919	1,732,300	46.43	0.142	7.32	4.35	12.49	3.7

SILICIOUS

1928	889,166	35.89	0.048	41.08	0.15	4.13	1.6
1927	1,064,123	37.29	0.058	38.35	0.21	4.41	2.1
1926	1,196,604	39.79	0.068	33.58	0.21	5.20	2.0
1925	1,169,498	39.91	0.055	32.37	0.29	5.99	2.1
1924	985,967	41.34	0.060	29.80	0.34	6.45	2.3
1923	1,145,344	42.17	0.055	29.30	0.34	6.50	1.9
1922	704,207	41.39	0.052	30.44	0.27	6.23	1.6
1921	414,950	45.50	0.052	25.29	0.27	7.31	1.8
1920	1,063,821	41.43	0.054	30.19	0.37	6.34	1.8
1919	576,147	41.11	0.049	30.85	0.46	6.60	1.2

AVERAGE OF ALL GRADES, ALL RANGES

1928	54,045,941	51.15	0.099	8.43	0.85	11.37	.....
1927	51,730,711	51.19	0.105	8.60	0.84	11.31	.....
1926	59,151,368	51.75	0.101	8.35	0.80	10.78	.....
1925	54,784,355	51.74	0.099	8.42	0.82	10.58	.....
1924	43,276,165	51.72	0.100	8.45	0.76	10.75	.....
1923	60,024,176	51.79	0.095	8.22	0.79	10.76	.....
1922	43,431,294	51.87	0.099	8.23	0.76	10.78	.....
1921	22,523,989	52.07	0.087	8.23	0.62	10.95	.....
1920	57,938,428	51.69	0.103	8.13	0.77	11.09	.....
1919	46,666,878	51.57	0.105	8.04	0.73	11.34	.....

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BRISTOL, CONN.—E. Ingraham Co., manufacturer of clocks, will erect a 6-story plant.

BRISTOL, CONN.—New Departure Mfg. Co. plans the construction of a new building here, 128 x 404 feet, to house the finish race grinding department and a plant, 106 x 220 feet, at Meriden, Conn., to house an extension of all manufacturing operations. (Noted March 7.)

HARTFORD, CONN.—The new 6-story addition to the plant of the Royal Typewriter Co. here has been completed and is now being equipped for production.

WASHINGTON—Potomac Electric Power Co., 321 Thirteenth street northwest, plans the construction of a power substation addition.

BANGOR, ME.—F. A. Patterson, 16 Central street, is architect for the 2-story plant, 75 x 90 feet, to be built for the Bangor Hydro Electric Co., Harlow street. (Noted Feb. 28.)

BOSTON—Bureau of yards and docks, navy department, State-War-Navy building, Washington, plans the construction of a power plant and distributing system here.

EAST BOSTON, MASS.—Bethlehem Shipbuilding Corp., 100 Milk street, Boston, plans the construction of a 1-story machine shop, 90 x 225 feet, at Border street here.

EVERETT, MASS.—Edison Electric Illuminating Co., Boston, has completed plans for a large steam generating plant in this district.

AVON, N. J.—Sheet Metal & Roof Craftsman Inc. plans to build a 2-story shop and office building. W. H. Conover, 114 Liberty street, is architect.

PALMER, N. Y.—New York Power & Light Corp., 126 State street, Albany, N. Y., plans the construction of a hydroelectric power plant here.

NORTH TONAWANDA, N. Y.—Landon Radiator Co. plans the construction of a 1-story building, 183 x 250 feet, to be used as a shop and warehouse.

ROCHESTER, N. Y.—The plant and offices of the Taylor Aircraft Corp. will be moved from here to Bradford, Pa., this spring. A new plant will be erected in Bradford, to adjoin the Bradford airport.

TAGHKANIC, N. Y.—New York Power & Light Co., 126 State street, Albany, N. Y., plans the construction of an electric light plant here.

MEDIA, PA.—Board of Delaware county commissioners plans the construction of a central power plant. S. A. Jellett Co., 1200 Locust street, is engineer.

PHILADELPHIA—General Electric Co., Witherspoon building, S. C. West manager, has let the contract for the construction of a 1-story warehouse addition and service shop to United Engineers & Constructors Inc., 1401 Arch street.

PHILADELPHIA—Philadelphia & Reading Coal & Iron Co. plans electrification of mechanical equipment and transportation, and the installation of modern machinery in collieries, in its program of improvements announced by Andrew J. Maloney, president.

WILLIAMSPORT, PA.—Lycoming Foundry & Machine Co. has let the contract for structural steel for a building to Belmont Iron Works.

PROVIDENCE, R. I.—S. & S. Die Casting Co. has purchased the plant formerly owned by William H. Hamblyn Co., Cranston, R. I., and will equip it for manufacturing.

East Central

CHICAGO—Chicago Foundry Co., 2028 North Major avenue, has let the contract for the construction of a 2-story addition, 75 x 80 feet.

CHICAGO—Vesta Battery Corp., W. S. Perry president, 2100 Indiana avenue, has awarded the contract for the construction of a plant at West Sixty-fifth street and Narragansett avenue.

CHICAGO—General contract for the construction of a 2½-story addition to the plant of the Peoples Iron & Metal Co., 5835 South Loomis street, has been awarded to Zisken Construction Co., 1338 West Sixty-third street. (Noted Feb. 7).

CHICAGO—Triner Scale & Mfg. Co., 2714 West Twenty-first street, has let the general contract for the construction of a 4-story plant, 125 x 145 feet, to Schmidt Bros. Construction Co., 22 East Huron street. (Noted March 7).

EAST ST. LOUIS, ILL.—East Side Levee & Sanitary district, J. D. Johns, 213 Metropolitan building, president, has received the lowest bid for two pumping stations, 43 x 75 feet and 28 x 30 feet, from H. H. Hall Construction Co., Murphy building. Equipment bid on includes oil burning engines, pumps, etc.

PEORIA, ILL.—Construction of a power plant is planned by the Keystone Steel & Wire Co. in addition to an improvement and extension program.

QUINCY, ILL.—W. O. Mayer, 138 Spruce street, is architect for the office, warehouse and foundry to be built for the Otis Elevator Co., same address. Additional equipment will also be required. (Noted Feb. 14).

ROCKFORD, ILL.—Whitney Metal Tool Co., 110 Forbes street, advises that it plans the installation of about $15,000 worth of equipment, some for expansion and some for replacement.

ROCKFORD, ILL.—Rockford Screw Products Co., incorporated recently, is now equipping the 3-story building at 1129 Railroad avenue, and will be ready for production shortly. The company has purchased the building containing about 40,000 square feet of floor space and will manufacture screws of all kinds and header products.

SOUTH CHICAGO, ILL.—Wisconsin Steel Co. has awarded the structural steel contract for a building to Vierling Steel Works.

GARY, IND.—Pacific Electric Co., R. E. McClann local manager, plans to build a plant and office building addition. I. M. Cohen, 738 Broadway street, is architect for the project.

INDIANAPOLIS—Indianapolis Power & Light Co., 48 Monument Circle, Elmer E. Scott secretary, plans the construction of a power plant.

INDIANAPOLIS—National Lamp Co., 3029 East Washington street, plans the construction of an addition to its plant to house the metallurgical work, now done at Little Ferry, N. Y. The National Lamp Co. was purchased recently by the P. R. Mallory Co. of Indiana. Machinery is being moved here from the east, manufacturing divisions of Elkon Inc., Weehawken, N. J.; and Knapp Electric Co., Port Chester, N. Y., being combined.

KOKOMO, IND.—Kokomo Steel & Wire Co. has let the structural steel contract for a building to Indiana Bridge Co.

PENDLETON, IND.—Hardy Enameling Co.

Sales Calendar

March 29.—McMyler-Interstate Co., Bedford, O., offering assets for sale, bids at first offering having been refused.

plans to build a new plant to replace the one burned in a recent fire.

ADRIAN, MICH.—Autorad Electric Corp. has purchased the former Michigan Fence Co. plant from Line-O-Scribe Inc. and is preparing to install conveyors and other equipment and make the plant ready for operations.

DETROIT—Cadillac Motor Car Co., 2680 Clark street, has let the structural steel contract for a plating room to R. C. Mahon Co.

DETROIT—Michigan Steel Tube Products Co., Holbrook and Buffalo avenue, plans the erection of a plant on Holbrook avenue, and has awarded the contract for the work to the Kriegshoff Co.

DETROIT—Federal Mogul Corp., 11031 Shoemaker avenue, has established a die casting division, to be housed eventually in the 25,000-square foot addition being built to plant No. 1 in Detroit.

DETROIT—Contract for the construction of a stamping plant addition for the Hupp Motor Car Co., 3641 East Milwaukee street, has been awarded to Everett Winters Co., Detroit. (Noted March 7.)

DETROIT—Burroughs Adding Machine Co., Cass and Burroughs avenues, has awarded the contract for the construction of a 1-story plant, 60 x 180 feet, to Corrick Bros., 507 Owen building. (Noted Jan. 31.)

DETROIT—Packard Motor Car Co., 1580 East Grand boulevard, has let the contract for the construction of a 3-story addition to the Aircraft Engineering building, East Grand boulevard and the Michigan Central railroad, to Everett Winters Co., Detroit. (Noted Feb. 28.)

DETROIT—Tripp Products Inc., 450 East Woodbridge street, incorporated recently, advises that it has taken over the plant and equipment of Tripp-Secord & Co., manufacturing a complete line of second spare tire carriers. (Noted March 7.)

FLINT, MICH.—Industrial Construction Co. has been awarded the general contract for the construction of a plant for the Flint Iron & Wire Works. George J. Bachman is architect. (Noted Jan. 17.)

GRAND RAPIDS, MICH.—Grand Rapids Metalcraft Corp. plans the construction of a plant for the manufacture of a ventilating heater for automobiles, to be built probably in Detroit.

HOLLAND, MICH.—Szekely Aircraft Corp. plans to rebuild its plant here as part of its expansion program.

JACKSON, MICH.—Riverside Forge & Machine Co. plans the construction of an addition to its forge shop and train sheds.

MONROE, MICH.—Detroit Stoker Co. has awarded the general contract for the construction of an addition, 25 x 153 feet, to its assembly shop building here.

MUSKEGON, MICH.—Maring Wire Co., F. L. Maring president, has announced an expansion program including erection of a plant addition to house 75 fine wire machines.

PONTIAC, MICH.—Oakland Motor Car Co. has let the contract for structural steel for an assembly building to R. C. Mahon Co., Detroit.

CINCINNATI—Cincinnati Milling Machine Co., Marburg avenue, has awarded the contract for the construction of a 1-story plant.

CLEVELAND—Ohio Worm & Gear Co., 3249 East Eightieth street, has awarded the general contract for the construction of a 1-story addition, 30 x 100 feet, to Albert M. Higley Co., Plymouth building.

CLEVELAND—Steel & Tubes Inc., 224 East 131st street, will have work started immediately on the construction of an addition to its plant to be used for a research laboratory, 80 x 140 feet. Austin Co., 16112 Euclid avenue, has the engineering and building contract.

CLEVELAND—Guide Motor Lamp Mfg. Co., 2130 West 110th street, subsidiary of the General Motors Corp., Detroit, plans to increase its production capacity by the rearrangement and installation of modern machinery and conveying systems. Work is expected to be finished by June.

COLUMBUS, O.—Contract for the construction of an ice plant for H. J. Schory of Canton, O., has been awarded to the F. & Y. Construction Co., work to be completed in 60 days. The machinery installation contract has been let to C. P. Wood Co., Cincinnati.

ELYRIA, O.—Fox Furnace Co., 206 Washington avenue, plans the construction of a 1-story addition to its foundry and plant, 101 x 119 feet.

HUNTINGTON, W. VA.—Chesapeake & Ohio railroad, Richmond, Va., has let the contract for structural steel for a car shop here to McClintic-Marshall Co., through Hughes-Foulkrod Co., general contractor. (Noted March 7.)

HARTFORD, WIS.—Kissel Motor Car Co. plans to make extensive additions to and replacements of tooling to provide for heavier production.

WEST BEND, WIS.—Metal Stamping Co. plans the purchase of new equipment to add to the present tooling and will install it in its newly acquired plant at Barton, Wis., about April 1.

Co., Akron, O., has let the contract for the construction of a power plant to be erected at its new tire manufacturing plant here, to Batson-Cook Co., West Point, Ga. (Noted Feb. 28.)

VALDOSTA, GA.—Georgia Power & Light Co., care of Alex Speer, Power & Light building, St. Petersburg, Fla., has awarded the contract for the construction of a 1-story ice plant, 90 x 100 feet, to J. Paul Jones Co., 3711 Seventeenth avenue south, St. Petersburg.

CROWLEY, LA.—Crowley Implement Co. suffered damage to its plant in a recent fire.

BLAIR, OKLA.—City, W. D. Snow clerk, plans to build a waterworks system, including pump, motor, deep well, etc. Milliken & Whitenech, Oklahoma City, are engineers.

CHATTANOOGA, TENN.—Southern Textile Machine Works, manufacturer of textile machinery, equipment and parts, plans the erection of a new plant.

EL PASO, TEX.—El Paso Electric Co., F. J. Cannon general manager, plans improvements during 1929 including increases in the generating capacity of the power system at various points.

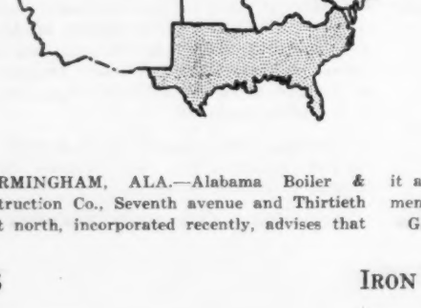
WICHITA FALLS, TEX.—Archer Oil Refining Co. has taken over and started operation of refinery at Megargel, Tex., in Archer county, formerly owned by Megargel Oil & Refining Co. W. H. Yeargen is plant manager.

RADFORD, VA.—Appalachian Electric Power Co., Bluefield, W. Va., subsidiary of the American Gas & Electric Co., New York, has made an appropriation of $11,000,000 for the construction of a hydroelectric project on the New river, near Radford.

NORFOLK, VA.—National Bearings Metal Co., A. H. McMahan, 1601 Green street, plans the construction of a plant addition for the manufacture of brass castings and bearing metals.

RICHMOND, VA.—Chesapeake & Ohio railroad plans additions to the railroad shops at Peru, Ind., including new yards, etc.

WEST NORFOLK, VA.—W. F. Dunn & Son Marine railroad plans immediate rebuilding of its machine shop, damaged in a recent fire.



Southern States

BIRMINGHAM, ALA.—Alabama Boiler & Construction Co., Seventh avenue and Thirtieth street north, incorporated recently, advises that it anticipates the purchase of additional equipment in the near future.

GADSDEN, ALA.—Goodyear Tire & Rubber

Western States

LONG BEACH, CALIF.—Ford Motor Co., Fordson, Mich., plans the construction of an assembly plant, 315 x 920 feet, including a power house, 83 x 101 feet.

LOS ANGELES—Atlas Brass Foundry, 1901 Santa Fe avenue, has purchased property adjoining its plant to be used for extension.

LOS ANGELES—California Malleable Castings

Co. has built an addition to increase its foundry floor and cleaning room capacity.

OAKLAND, CALIF—Continental Can Co., 155 Montgomery street, San Francisco, has let the contract for the construction of a 3-story plant at Russett street and Fifty-fourth avenue, here.

SACRAMENTO, CALIF.—Consumers Ice & Cold Storage Co., Ninth and C streets, has let the contract for the construction of an ice plant, including machinery and equipment, to W. W. Williamson, 345 Market street, San Francisco.

WEST SACRAMENTO, CALIF.—Peerless Iron Works, Second and O streets, plans the construction of a 1-story plant including a machine shop 56 x 96 feet, pattern shop 30 x 40 feet, and foundry 52 x 64 feet.

BOISE, IDAHO—Bureau of reclamation, Denver, will receive bids until June 15 for the construction of a hydroelectric dam on Deadwood river.

NEPHI, UTAH—City council is calling for bids for machinery and equipment for its hydroelectric power plant to be built in Salt Creek canyon, above the present power plant. The new plant will be controlled automatically from the present plant. (Noted Jan. 24.)

West Central

MONTICELLO, IOWA—Franklin Equipment Co. has absorbed the St. James Ventilating Co., St. James, Minn., and will move its equipment here where manufacturing will be carried on under direction of the Franklin company. This action is taken instead of the St. James company absorbing the Franklin company as stated previously. (Noted Jan. 17.)

BILLINGS, MO.—City will vote on $35,000 bonds for waterworks improvements, including booster pumps, tank on tower, etc. Russell & Axon, McDaniel building, Springfield, Mo., are engineers.

POPLAR BLUFF, MO.—Missouri Natural Gas Co., Dubuque, Iowa, plans the construction of a gas plant here. Thomas Milliner, 327 South La Salle street, Chicago, is engineer.

ST. LOUIS—Guardian Aircraft Corp., Derek White, 2500 Texas avenue, president, plans the construction of an airplane manufacturing plant, 100 x 500 feet. Complete woodworking and metalworking machinery will be installed.

HARVEY, N. DAK.—Central Light & Power Co., Dubuque, Iowa, plans the construction of a new plant here.

WASHBURN, N. DAK.—Otter Tail Power Co. plans the construction of an addition to its plant here to house a 7000-horsepower turbine, with a new boiler and supplementary machinery.

Canada

TORONTO, ONT.—Canadian Wirebound Boxes Ltd. has let the structural steel contract for a plant to Dominion Bridge Co. (Noted Jan. 24.)

DOLBEAU, QUE.—Lake St. John Power & Paper Co., 1117 St. Catharine street west, Montreal, Que., will start work soon on the construction of a lock in the Mistassibi river here. It will be 900 feet long with 45 feet waterhead and produce 15,000 horsepower.

MONTREAL, QUE.—Atlas Metal Bed Mfg. Co., 3001 St. James street, plans the erection of a manufacturing plant here.

MONTREAL, QUE.—Stinson Reed Builders' Supply Co. Ltd., 350 Dorchester street west, contemplates building a plant on DesErables street.

MONTREAL, QUE.—Northern Electric Co. Ltd., 121 Shearer street, will call for bids next month for addition to its plant at Richmond and Richardson streets.

MONTREAL, QUE.—Bids for the supply and installation of electric pumps with motors and other appurtenances, in the McTavish street pumping station here, are being received by the executive committee at the city hall, until March 30. Plans and specifications at office of Montreal water board, 3161 Joseph street.

Recent Incorporations

ANNISTON, ALA.—King Metal Products has been incorporated with $25,000 capital to manufacture various kinds of steel castings by T. C. King president and general manager. The company will locate on the site of the old National Forge Co., South Anniston.

HARTFORD, CONN.—Stat-Amatic Instrument & Appliance Co. has been organized here to manufacture and distribute an automatic heat controlling apparatus.

CHICAGO—Planert Tool & Mfg. Co., 400 South Hoyne avenue, has been incorporated with $5000 capital to operate a general machine shop business, by Edward H. Planert.

CHICAGO—Korwin Flyer Co., 208 South La Salle street, has been incorporated with 10,000 shares no par value stock to manufacture and deal in machines, ships, etc., by T. G. Deering.

CHICAGO—Forsythe Automatic Train Conductor Co., 39 South La Salle street, has been incorporated with $50,000 in preferred shares and 1000 shares no par value stock, by Fred H. Arnd.

CHICAGO—Midwest Metal Mfg. Co., 4730 West Fifth avenue, has been incorporated with $100,000 capital to manufacture and deal in sheet metal and iron, by Joseph Vani.

CHICAGO—Paragon Die Casting Co., 3225 Ravenswood avenue, has been incorporated with $50,000 in preferred shares and 500 shares no par value stock to manufacture and deal in tools, machinery, etc., by Frank Lannert.

CHICAGO—Walstrom Mfg. Corp., 4121 Lake street, has been incorporated with $50,000 in preferred shares and 500 shares no par value stock to manufacture and deal in household utensils, vacuum sweepers, etc., by Ferdinand Klass.

CHICAGO—Central Pattern & Foundry Co., 3737 South Sacramento avenue, has been incorporated to engage in a general foundry and machine shop business by Good, Childs, Bobb & Wescott, 231 South La Salle street, correspondents.

MAYWOOD, ILL.—Maywood Mfg. Co., 1325 South Third avenue, has been incorporated with $20,000 capital to manufacture and deal in metal specialties by Richard A. Hicks.

SYCAMORE, ILL.—Marlow Kellman Corp., Park Ridge avenue, has been incorporated with $200,000 common stock and $55,000 preferred stock, to manufacture and deal in laundry machinery, wood products, etc., by Sol D. Guggenheim.

ROCKFORD, ILL.—Rockford Sheet Steel Co., 309 Rockford National Bank building, has been incorporated with $50,000 capital to manufacture and deal in sheet steel, machinery, etc., by L. I. Kios.

ROCKFORD, ILL.—Rockford Forging Die & Tool Co., 1846 Eighteenth avenue, has been incorporated with $20,000 capital to engage in a general forging, die and tool business by Eric W. Johnson.

BOSTON, MASS.—Self Feeding Carburetor Co. Inc. has been incorporated with 1800 shares no par value stock to manufacture carburetors and other machinery and devices by Maxwell E. Foster, Topsfield, Mass.

BOSTON—Malden Bronze Foundries Inc. has been incorporated with 5000 shares no par value stock to manufacture statuary, ornamental bronze, etc., by Charles V. S. Paul, 722 Commonwealth avenue.

BOSTON—Rotosales Mfg. Co. has been incorporated with 500 shares no par value stock to manufacture and deal in machines used in display advertising, by Harry A. Brown, Kennison road, Somerville, Mass.

BOSTON—Atlantic Heat & Power Co. has been incorporated with 100 shares no par value stock to manufacture machinery, generators, motors, lamps, etc., for heat and power, by Miner L. Hay, 470 Atlantic avenue.

BOSTON—S. W. Burke Shoe Pattern Co. Inc.

has been incorporated with $20,000 capital to manufacture and deal in machinery for the making of lasts, patterns and other parts of shoes, by Sidney W. Burke, 80 Newhall street, Lynn, Mass.

CAMBRIDGE, MASS.—Raytheon Vita Health Lamp Co. has been incorporated with 10,000 shares no par value stock to manufacture machinery, apparatus, and devices connected with the use of heat, light, etc., in medicinal, therapeutic or commercial ways, by Edward C. Thayer, 238 Main street.

FALL RIVER, MASS.—Troy Hardware Co. Inc. has been incorporated with $20,000 capital to manufacture hardware, including tools, cutlery, farm implements, etc., by Henry J. Feitelberg, 237 Grove street.

LYNN, MASS.—Excel Taping Machine Co., 130 Eastern avenue, has been incorporated with $50,000 capital to manufacture taping machines, etc., by Horace M. Eaton.

NEWTON, MASS.—Cortell Supply Co. has been incorporated with 100 shares no par value stock to manufacture and deal in iron, steel, machinery, etc., by Bernard Cortell, 53 School street, Dorchester, Mass.

WORCESTER, MASS.—Great Roofing Co. Inc. has been incorporated with 500 shares no par value stock to manufacture ornamental sheet metal work, roofing material, etc., by Charles Wald, 62 Trenton street.

WORCESTER, MASS.—Fowler Oil Burner Co. has been incorporated with 1000 shares no par value stock to manufacture oil burners and heating apparatus of all kinds, by Philip M. Morgan, 15 Belmont street.

DETROIT—Cooper Spring Service Co. has been incorporated with $10,000 capital to manufacture and repair automobile springs, by George W. Cooper, 477 Charlotte avenue.

DETROIT—Abrasive Engineering Corp., 1248 Washington boulevard, has been incorporated with $10,000 capital to engage in the general abrasive industry, by George F. Gokey Jr.

DETROIT—N. S. W. Co., 1113 Marcy street, has been incorporated with $6000 capital to manufacture and deal in metal products used in connection with windows and doors, by Frank E. Glass.

JACKSON, MICH.—Watts Morehouse Mfg. Corp., East Michigan avenue, has been incorporated with $100,000 capital to manufacture and deal in automobile parts, trucks, etc., by Harmon E. Morehouse.

CARTERET, N. J.—Canda-Gayley Steel Corp. has been incorporated with 10,000 shares no par value stock to manufacture iron and steel products by Humes, Buck & Smith, 50 Broadway, New York, attorneys.

EAST ORANGE, N. J.—Brooks-Thomas Inc. has been incorporated with $125,000 capital to manufacture heating systems, by United States Corporation Co., 150 Broadway, New York.

IRVINGTON, N. J.—Reliable Iron Works Inc. has been incorporated with $125,000 capital to manufacture and deal in ornamental iron by J. I. Kaplan, Newark, attorney.

NEWARK, N. J.—E. Behringer Sheet Metal Works Inc. has been incorporated with $200,000 capital by John T. Booth, 233 Broadway, New York.

BROOKLYN, N. Y.—Wheel Parts & Mfg. Co. has been incorporated with $75,000 capital by D. & J. Freiberger, 22 East Fifty-fifth street, New York, attorney.

NEW YORK—Lebros Iron Works has been incorporated with $20,000 capital by H. Rappaport, 26 Court street, Brooklyn, N. Y., attorney.

NEW YORK—S. D. Z. Metal Spinning Co. has been incorporated with $5000 capital by D. Rosenow, 120 West Forty-second street, attorney.

NEW YORK—Winchester Screen & Metal Weatherstrip Co. has been incorporated with $10,000 capital by S. Rothstein, 51 Chambers street, attorney.

CLEVELAND—Efficient Tool & Die Co. has been incorporated with $12,500 capital by S. A. Titus, East Ninth street and Vincent avenue, attorney.

CALGARY, ALTA—Western Implement Mfg. Co. Ltd. has been incorporated to manufacture and deal in machines, tools, etc., and to carry on the business of iron founder, and metal worker, with $250,000 capital by Percy L. Sanford, Alexander H. Everett, James Chambers and others all of Calgary.

BELLEVILLE, ONT.—Vex Lawn Service Equipment Co. Ltd. has been incorporated to manufacture and deal in machinery, implements, equipment, etc., with $10,000 capital by William E. Rowsome, Stanley Hagerman, Richard D. Ponton and others, all of Belleville.

GALT, ONT.—Sandilands Valve Mfg. Co. Ltd. has been incorporated to manufacture and deal in iron and steel products with $100,000 capital and 5000 shares no par value stock by Thomas H. Watson, James Sandilands, Toronto, and Robert M. Hamilton, of Galt.

HAMILTON, ONT.—Fred T. Brooks Ltd. has been incorporated to manufacture and deal in commercial signs with $125,000 capital by Fred T. Brooks, Thomas S. Brooks, John A. J. Moore, and others, all of Hamilton.

HAMILTON, ONT.—Kolelectric Underfeed Stoker Co. Ltd. has been incorporated to manufacture and deal in engines, machinery, generators, batteries, etc. with $25,000 capital and 750 shares of no par value stock by Arthur Hartley, Herbert H. Walsh, James W. Corner and others, all of Hamilton.

TORONTO, ONT.—Burton Pitt Moisture Control Ltd. has been incorporated to manufacture and deal in appliances to control moisture, with $50,000 capital by Eli F. Burton, Arnold Pitt and Thomas N. Phelan, all of Toronto.

TORONTO, ONT.—Brown's Sport & Cycle Co. Ltd. has been incorporated to manufacture and deal in bicycles, motorcycles, parts and accessories with $80,000 capital by Percival A. McBride, Floyd E. Quennell, William A. Brown, all of Toronto.

TORONTO, ONT.—Kilmer Gibson & Van Nostrand Ltd. has been incorporated to carry on the business as engineer and contractor, with $500,000 capital and 25,000 shares no par value stock by James S. Beatty, John R. Rumball, George P. Dean and others, all of Toronto.

TORONTO, ONT.—Red Seal Wiring Appliances & Fixtures Co. Ltd. has been incorporated to manufacture and deal in wiring devices and electrical appliances, with $40,000 capital by Clarence A. McLean, Robert A. I. Gray, George W. Patterson and others, all of Toronto.

WELLAND, ONT.—R. Timms Construction Ltd. has been incorporated with 40,000 shares no par value stock by Reginald Timms, Robert B. Law and others, all of Welland.

WINDSOR, ONT.—Tool Salvage Ltd. has been incorporated to manufacture and deal in tools, castings, machinery, etc., with 25,000 shares of no par value stock by Norman A. McLarty, John W. Reid, and others, of Windsor.

MONTREAL, QUE.—United Engineers & Contractors (Canada) Ltd. has been incorporated with $500,000 capital and 25,000 shares of no par value stock by William Taylor, Angus M. Murray, Douglas R. Hornsby and others, all of Montreal.

MONTREAL, QUE.—F. L. Smith & Co. of Canada Ltd. has been incorporated to carry on the business of engineer and contractor, and manufacturer of industrial plants, engines and machinery with $100,000 capital by Kenneth Archibald, Roger Brossard, Wendall H. Laidley, and others, all of Montreal.

New Trade Publications

GASOLINE HOIST—A current folder by the American Hoist & Derrick Co., St. Paul, is devoted to a newly-designed hoist, powered by a gasoline motor. Power is transmitted by a silent chain to what would be the crank shaft of a steam hoist. The folder also shows the company's two-speed drag scraper hoist. This serves as the power plant of a portable dragline installation.

DIAMOND CORE DRILLS—Sullivan Machinery Co., Chicago, has issued a bulletin on equipment and supplies for its diamond core drills. It covers a large line of accessories for drills, with tables of data and dimensions.

NICKEL ALLOY STEEL—International Nickel Co. Inc., New York, has brought its buyers' guide to date as of Jan. 1, 1929. The guide covers all items frequently called for and information as to sources of supply for other materials is supplied by the company direct.

BATTERY CHARGERS—General Electric Co., Schenectady, N. Y., has issued a bulletin on battery-charging equipment, with illustrations of panels and chargers.

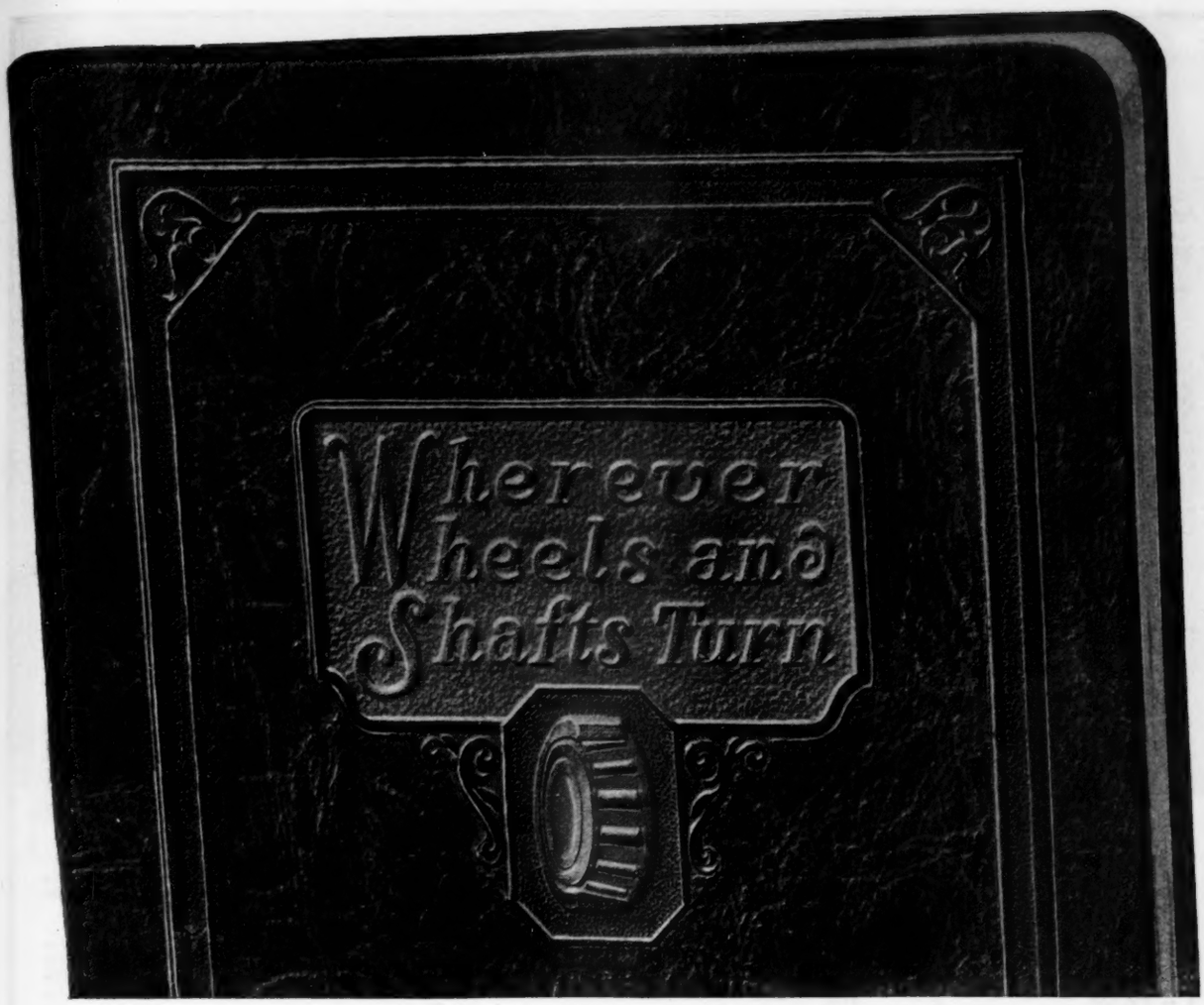
LUBRICATING DEVICES—Gits Bros. Mfg. Co., Chicago, has issued a catalog of its oil cups and lubricating devices, covering its entire range.

VALVES—Golden-Anderson Valve Specialty Co., Pittsburgh, presents in its current catalog its entire line of automatic cushioned valves for steam and water. Illustrations and diagrams cover construction and operation.

DIE SETS—F. A. Baumbach Mfg. Co., Chicago, has issued a catalog of its die sets and accessories, covering its line of dies and supplies. It is illustrated by halftones and diagrams and dimension tables give data.

DESULPHURIZERS—Mathieson Alkali Works Inc., 200 Park avenue, New York, has issued its bulletin on the use of its desulphurizing compound in the manufacture of malleable iron.

PATTERN LETTERS AND FIGURES—H. W. Knight & Son, Seneca Falls, N. Y., in a current bulletin has described and illustrated its line of pattern letters and numbers. Price lists are given for the various sizes and illustrations show styles. The catalog also contains information concerning the metal stamps, dowel pines and branding irons.



A BOOK WITH A *DOUBLE* VALUE TO YOU

The new 150 page Timken Book shows how universal Timken Bearings have become in every kind of equipment—how they have revolutionized operating and maintenance costs wherever wheels and shafts turn throughout all Industry—how they can do the same in all of the equipment used in your plant.

It is of *double* value to you because it contains so much technical information on bearing mountings and installations. It deserves a permanent place in your library. A copy? For the asking!

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Pipe and Tube Prices—Plate Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLING

	Black	Galv.
Butt Weld		
¼ and ⅜-inch	+11	+36
½-inch	23	5
¾-inch	28	11
1 and 1¼-inch	31	15
1½ and 2-inch	35	18
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1 to 2-inch	34	18
Lap Weld		
2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ to 3¾-inch	56 off
4-inch	59 off
4½ to 6-inch	48 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. On 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	42 off

SEAMLESS HOT ROLLED

1¾-inch	39 off
2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
21-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot.... .20c
Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A-B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

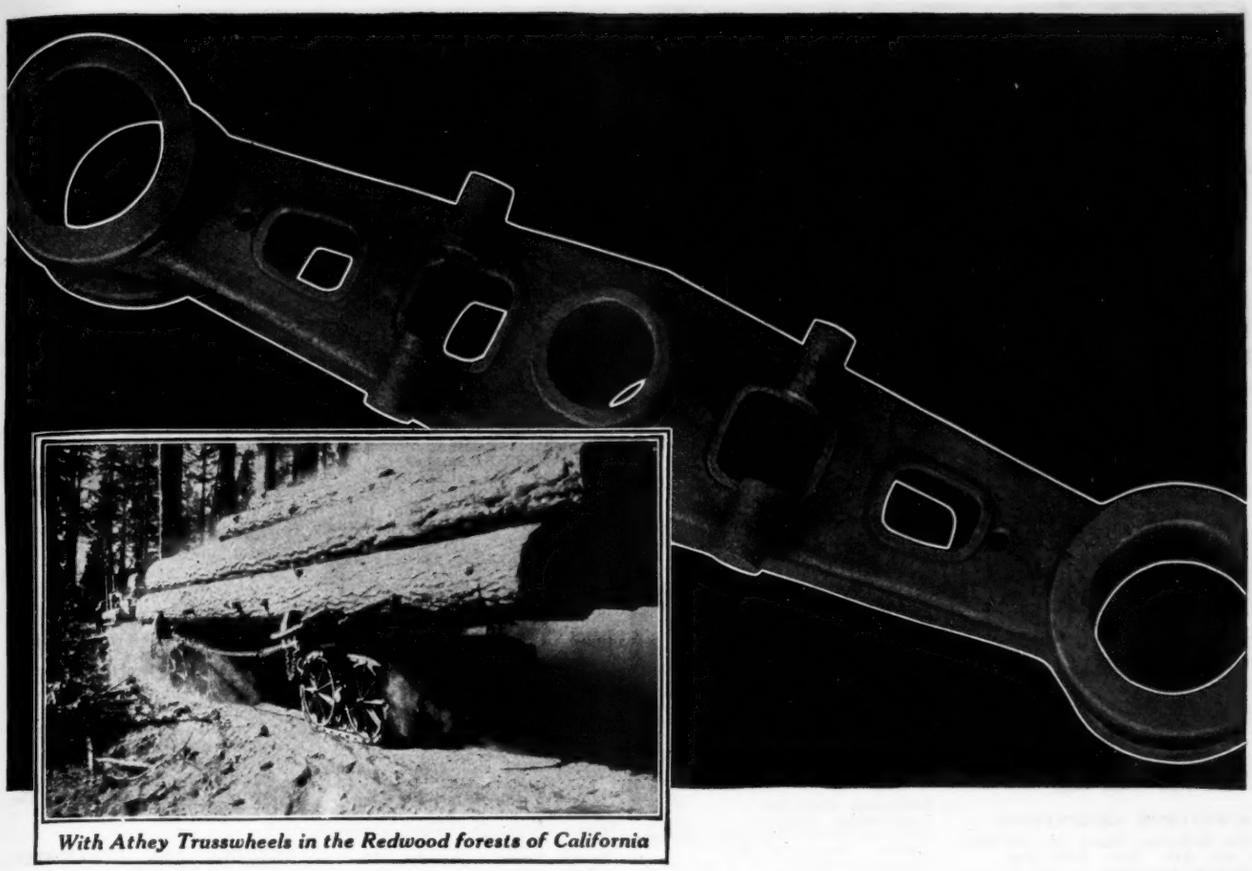
Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)
Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)
Additional extra ..... .20c



With Athey Trusswheels in the Redwood forests of California

Where Breakdowns *Must Not* Happen

Athey Trusswheels are used in outlying regions where severe usage is common custom — repairs hard to get —and breakdowns mean expensive delays.

Under such conditions it is only natural that Sivyer Alloy Steel Castings should be prominent in the construction.

Sivyer is usually chosen to cast such jobs because: Sivyer makes a wide range of standard alloys that meet toughest requirements — and because Sivyer foundry and inspection practice assure castings that are consistently sound and true to formula.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

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United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

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International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
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Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
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International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

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American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 410 Oliver Bldg., Pittsburgh, Pa.

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Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
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Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM BRONZE (Acid Resisting)
Duriron Co., Inc., The, Dayton, Ohio.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

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Farrell-Cheek Steel Foundry Co., Sandusky, O.
Petroleum Iron Works Co., The, Sharon, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

ANVILS (Cast Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

ARCHES (Suspended)
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

ARCHITECTS (Industrial)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., 3675 E. 78th St., Cleveland.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

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American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

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Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.

BARS (Concrete Reinforcing)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
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Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
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Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
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BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Pacific Coast Steel Co., Hunter-Dulin Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
Phoenix Iron Co., The, 20 So. 15th, Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

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Williams Alloy Products Co., The, Elyria, Ohio.

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Hyatt Roller Bearing Co., Newark, N. J.
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BEARINGS (Tapered Roller)
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Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Alloy and Carbon Steel)
Central Alloy Steel Corp., Massillon, O.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Die Stock Steel)
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Erie Forge Co., Erie, Pa.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
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BILLETS (Forging, Alloy Steel)
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